Feb. 13, 1951 V. CERINO 2,541,404

MECHANICAL BODY AND LEG MOVEMENTS OF FIGURE TOYS

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Fig. 1.

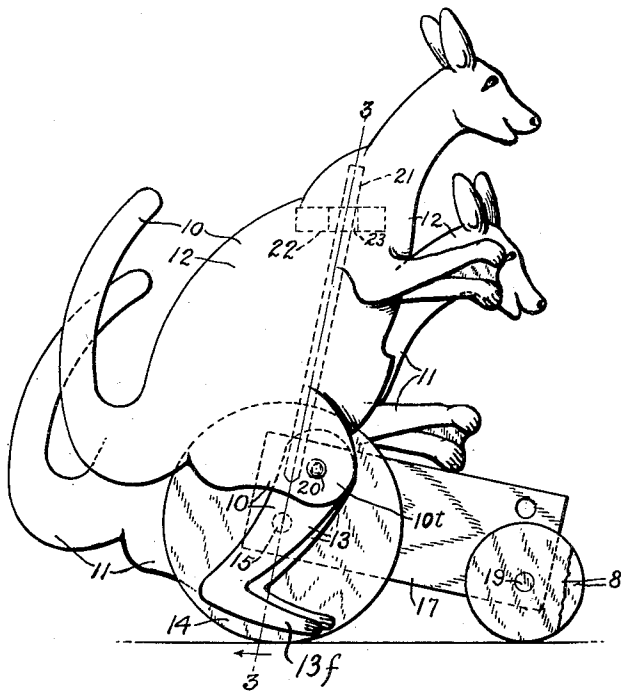


Fig. 3.

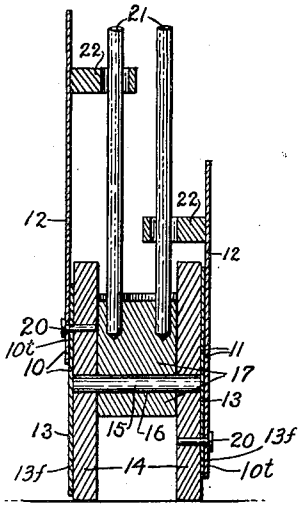


Fig. 2.

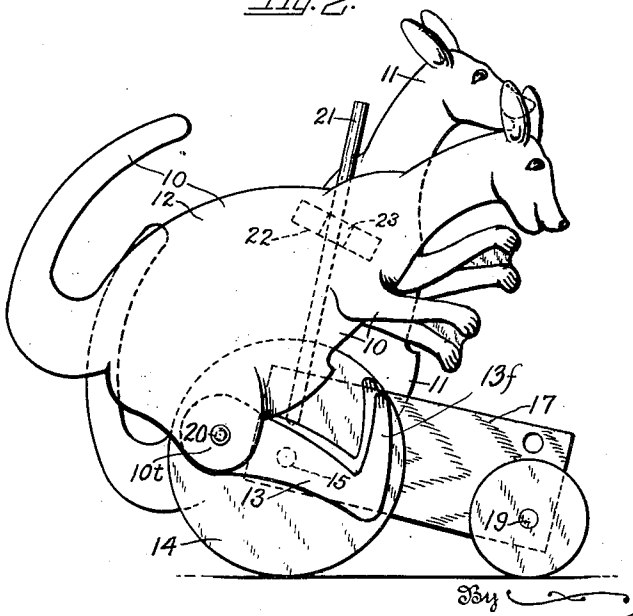


Fig. 4.

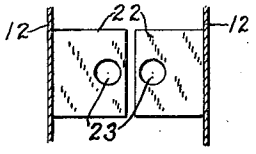
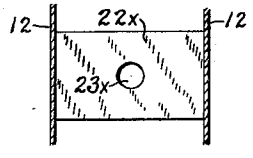


Fig. 5.



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MECHANICAL BODY AND LEG MOVEMENTS OF FIGURE TOYS

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Fig. 1a.

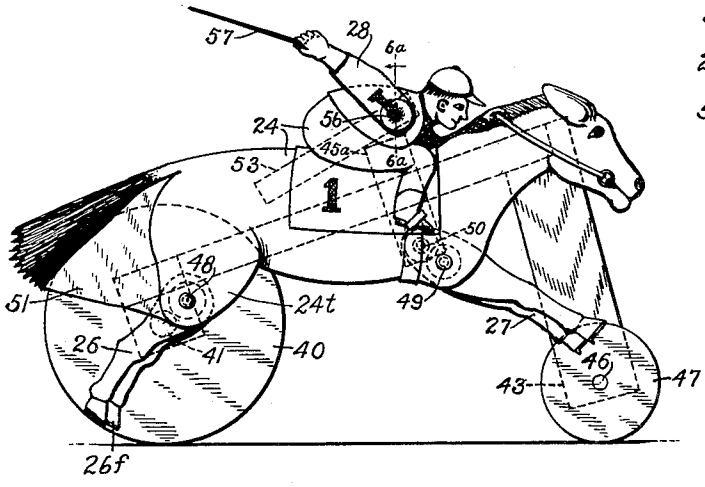


Fig. 3a.

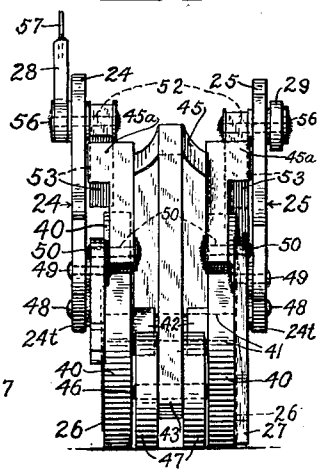


Fig. 2a.

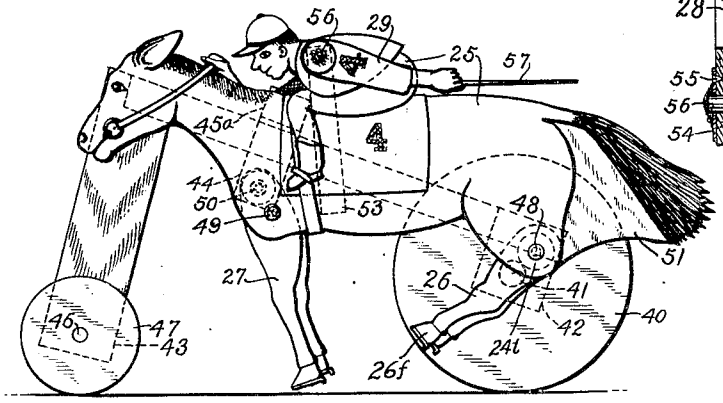


Fig. 6a

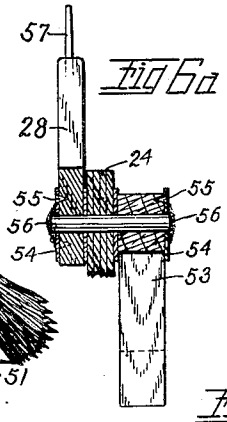


Fig. 7a.

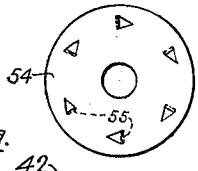


Fig. 5a.

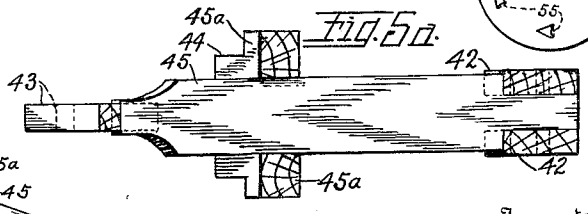
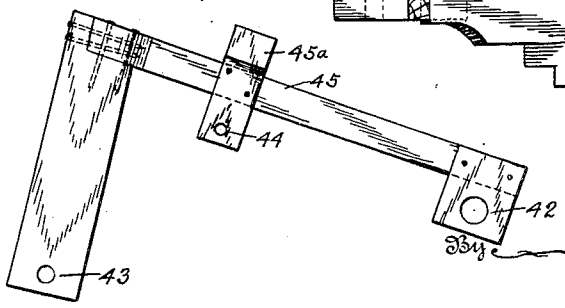


Fig. 4a.



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MECHANICAL BODY AND LEG MOVEMENTS OF FIGURE TOYS

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Fig. 1b.

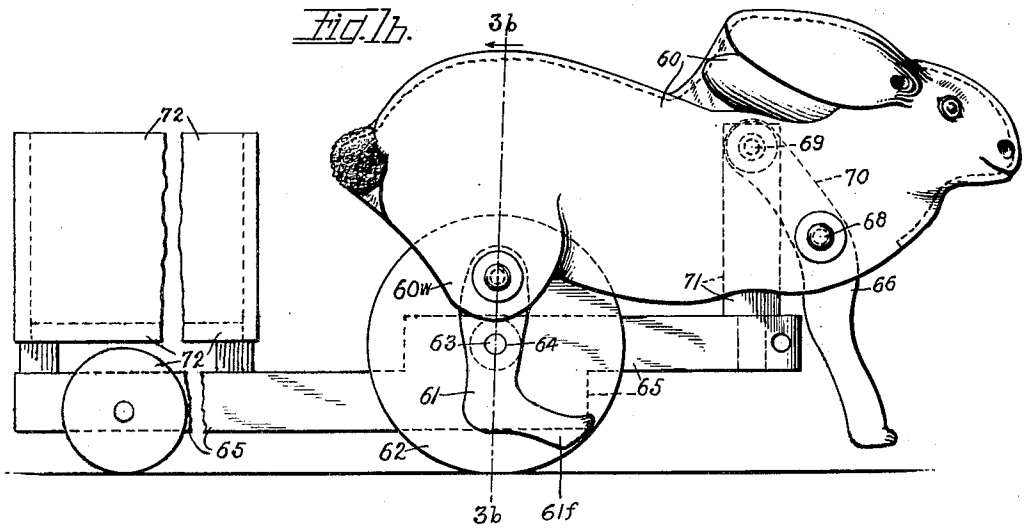


Fig. 2b.

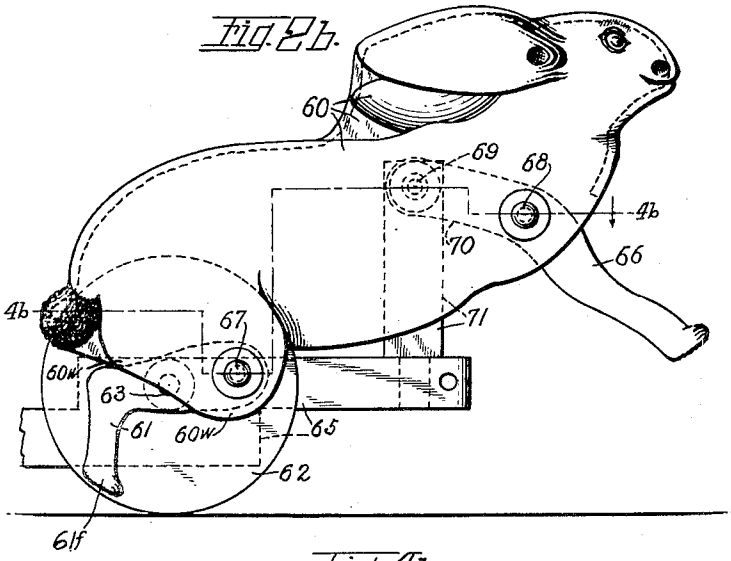


Fig. 3b.

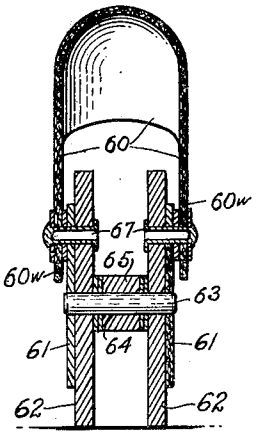
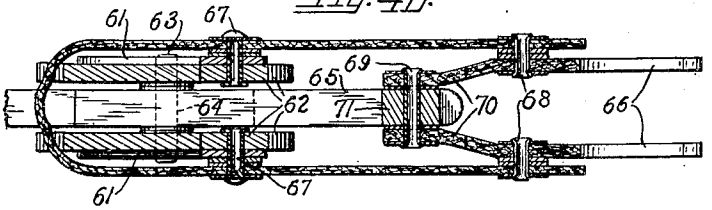


Fig. 4b.



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UNITED STATES PATENT OFFICE

2,541,404

MECHANICAL BODY AND LEG MOVEMENTS OF FIGURE TOYS

Vincent Cerino, Baltimore, Md.

Application June 8, 1945, Serial No. 598,286

7 Claims. (Cl. 46—105)

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This invention relates to wheeled figure toys, and especially to mechanical body and leg movements of figure toys.

One object of this invention is to provide animal-simulants with means to move their bodies and legs in very realistic simulation of the natural movements of certain animals when running, leaping etc.; while keeping considerable portions of the actuating means hidden in or between the body-simulants or main units of the animal-simulants.

Another object is to minimize the number of primarily separate parts of the animal-simulant and of the operating or actuating means; also to simplify the construction of each element or unit; thereby to minimize the cost of manufacture.

Another object is to provide all the units of such construction that they may be formed from any one of numerous materials.

Therefore, while wood is indicated in some figures of the accompanying drawings, and fibrous composition is indicated in other figures, the invention is not limited to any specific material or combinations of materials.

Moreover, while these drawings show simulants of kangaroos, horses and rabbits (or a rabbit), the term, animal-simulant, as used herein, is intended for consideration in the broadest sense, viz., to include "any sentient organism other than a plant" that is applicable within the scope of this invention.

In the drawings, Fig. 1 is a right-side elevation of one form of the invention that features animal-simulants representing a pair of racing and leaping kangaroos on opposite sides of a wheeled vehicle-simulant that constitutes the means for actuating the animal-simulants.

Fig. 2 is a view of the same side of the same elements as shown in Fig. 1, but the positions of the bodies and rear legs of the animal-simulants being changed by about two-thirds of a forward revolution of the rear ground-wheels or actuating wheels.

Fig. 3 is a sectional view taken approximately and substantially along the line 3—3 of Fig. 1.

Fig. 4 is a sectional-fragmental view that shows two guiding elements united with upper parts of the respective animal-simulants, as seen from above.

Fig. 5 is a view similar to Fig. 4, but showing only one guiding element that serves as a rigid coupler secured to each of the animal-simulants so as to unite them for operation in unison or as a single animal-simulant.

Fig. 1*a* is a right-side elevation of a modified

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form of the invention in which a horse and jockey are featured as animal simulants united in a main unit of the animate portion, the contesting horse and jockey, that are attached to the left or far side, being omitted in this view for the sake of avoiding confusion.

Fig. 2*a* is a left-side elevation of the contesting horse and jockey (mentioned in the preceding paragraph), attached to or united with the left side of the supporting and actuating means of which the right side is shown in Fig. 1*a*.

Fig. 3*a* is an elevation as viewed from a point in front of the animal-simulants, showing the relative positions of the main units and the pivotally connected minor units that represent legs, arms etc.

Fig. 4*a* is a left-side elevation of the supporting frame-unit as constructed of wood.

Fig. 5*a* is a top plan view of the unit shown in Fig. 4*a*.

Fig. 6*a* is an enlarged sectional view taken along the line 6*a*—6*a* of Fig. 1*a*.

Fig. 7*a* is a much enlarged view of a securing disc such as the two at the pivot-ends of the jockey's shoulders.

Fig. 1*b* is a right-side elevation of a second modification, viz., one in which a simulant of a rabbit is featured in connection with a simulant of a cart or wheeled vehicle that constitutes the means to support and actuate the animal-simulant, a part being broken out.

Fig. 2*b* is a right-side elevation of the same animal-simulant seen in Fig. 1, but showing a body-simulant and leg-simulants in positions that result from about a quarter of a revolution of the wheel that is the main actuating element.

Fig. 3*b* is a transverse vertical sectional view taken along the line 3*b*—3*b* of Fig. 1*b*.

Fig. 4*b* is a substantially horizontal sectional view taken along the zigzag line 4*b*—4*b* of Fig. 2*b*.

Referring to these drawings in detail, in which, similar reference characters refer to similar parts in the several views, the invention is described in detail as follows:

In Figs. 1, 2 and 3, two animal-simulants 10 and 11 comprise body-simulants or main units 12 and rear leg-simulants 13, the latter being united with ground-wheels 14 which constitute the main actuating units of the animal-simulants. An axle 15 is united with the centers of the wheels by glue or other appropriate means and extends through a bearing 16 in a block or frame-element 17 whose front end is carried by wheels 8 and an axle 19. This block and these wheels and axles constitute a carriage and support for the ani-

mal-simulants, a road-vehicle-simulant, and an element of the means to actuate and control the movements of the main units 12 and leg-simulants 13; for the leg-simulants 13 are not only glued or painted on the respective wheels 14, but are also provided with a pivot or eccentric 20 for each wheel and its united leg-simulant 13. Each pivot 20 extends thru a bearing in the lower rear end-portion or thigh portion 10*t* of a correlated main-unit or body-portion of the pair of animal-simulants, so that, when the wheel 14 is rolled forward on a floor or other upwardly facing surface, from the position shown in Fig. 1, the eccentric or pivot 20 (of Fig. 1) permits the main unit of the near animal simulant 10 to be lowered until such pivot passes the lowermost point, whereupon, as the wheel continues to roll forward, this near-side main unit is raised to and beyond the point or position shown in Fig. 2, and so on for each revolution of the wheels 14, effecting repeated raising and lowering cycles of each animal-simulant. Inasmuch as the pivots are at opposite sides of the axle 15, one main unit 12 is lowered as the other is raised, so that one main-unit counterbalances the other so as to effect ease of operation, also to enhance the simulation of natural movements of leap-racing of animals such as kangaroos, frogs, rabbits etc.

For cooperation with the elements 14, 15, 20 etc., in supporting the main units 12 in upright positions and forwardly inclined positions, upright guiding elements or rods 21 are united with the block 17 and project thru apertured keepers or guide-elements 22 in which the apertures 23 are so large that they afford room for tilting movement of said keepers with respect to the respective rods 21, as well as longitudinal movement of the rods with respect to the elements 22. Therefore, as the wheels 14 roll forward precise circular rotation of the pivots 20 and near-vertical movement of the elements 22 cooperate to effect a variety of compound wabbling or oscillatory movements of different parts of the main units 12, in addition to the forward movement imparted by the rolling of the wheels forwardly; and the directions of movement of each unit 12 are, at any given moment, substantially opposite to those of the other unit 12, so they produce the visual effect and other advantages mentioned in the foregoing.

However, it is possible and practicable to eliminate one of the animal-simulants without affecting the operation and movements of the other one; and it is also possible and practical to put the pivots 20 in axial alinement, so that the two animal simulants operate in unison, and for this latter achievement, I present the apertured guide-element 22*x* (of Fig. 5), having only one aperture 23*x* and having its opposite edges united with both main units 12 of the two animal-simulants; so one rod 21 can be eliminated; and the two animal-simulants not only move in unison, but more nearly appear as a single animal, especially if the backs of the two main units are united in an arch such as or similar to that shown in Fig. 3*b*.

In Figs. 1*a*, 2*a* and 3*a*, the main units of the animal-simulants 24 and 25 comprise horse-body simulants with jockey-simulants united, respectively, therewith; and these and the leg-simulants 26 and 27 are formed of thicker sheet material than that of the main units 12 which may be of metal or of hard-pressed card-board or composition; whereas, the simulants 24, 25, 26, 27, 28, and 29 may well be formed of "plywood" or any other suitable laminated wood or light-weight composition; such laminations being indicated in Fig. 6*a*, at 24. The rear leg-simulants 26 are united with ground-wheels or main actuators 40 whose axle 41 is journaled in rear bearings 42 of the supporting frame which latter includes a front bearing 43 and intermediate bearings 44 (most clearly shown in Fig. 4*a*). These bearings 44 are united with a beam 45 of the supporting frame which also includes abutments 45*a*. An axle 46 is journaled in the bearing 43 and is united with front ground-wheels 47 for cooperation with the main frame and rear ground wheels to complete a carriage for supporting main-units of the animal-simulants 24 and 25 together with their operating elements 26, 27, 28 and 29 which are connected and operated as follows:

As the rear leg-simulants 26 are intimately united with the respective rear wheels, and reenforced thereby, they may be very thin (as seen in Fig. 3*a*), being either painted, pasted or glued on the rear wheels. Pivots or eccentrics 48 operatively connect the thigh portion or rear end-portion 24*t* of the animal-body-simulant of each animal-simulant to the correlated one of the rear wheels; pivots 49 operatively connect the front leg-simulants to the main units of the respective animal simulants 24 and 25; and pivots 50 operatively connect the upward extensions of the front leg-simulants to the respective bearings 44. Therefore, as the carriage is moved forward so as to cause the rear wheels to roll forward, the rear leg-simulants then rotate from the visible positions to invisible or hidden positions, first behind the webs 51, then behind the thigh-portions, and then emerge from behind the thigh and belly portions from where they continue downward to where their feet appear to touch the track whence they continue rearward with respect to the main units; though, in fact they are moving forward with respect to the track or surface on which the carriage travels.

During the rearward movements of the rear leg-simulants, the eccentrics 48 push the respective main units 24 and 25 forward with respect to the main frame; and as this moves the pivots 49 forwardly while the pivots 50 are held in the bearings 44 of the main frame, the resultant action of the front leg-simulants is forward and upward, while the rear leg-simulants move rearward and upward; and the resultant combined action very closely simulates the natural loping or galloping movements of real horses or other quadrupeds.

Now, referring especially to Figs. 6*a* and 7*a*, and noting the section taken at 6*a*—6*a* of Fig. 1*a*: the upper portion of the main unit 24 is indicated as being of laminated sheet material, and is provided with a bearing thru which extends a pivot or pintle 52. One end of this pintle 52 is secured to the arm-simulant 28, while its other end is secured to an actuating arm 53. In cases where the pintles 52 are metal, their ends may be soldered to securing metal-discs 54 formed with spurs 55 thereon for being embedded in the respective elements 28 and 53, and the ends of the pintle are soldered to the respective discs as seen at 56. Each main unit 24 and 25 (Figs. 1 and 2) has a combination of units 45*a* and 53 operatively connected thereto, and each actuating arm 53 is in proper position to slide against the contiguous abutment 45*a* as the main unit 24 or 25 moves forward, upward, rearward and

downward; so the cooperation of these elements 45a and 53 with elements 41 to 48 effects the oscillatory movements of the elements or arm-simulant 28 and 29, so as to simulate urging the horses to faster action by use of the whip-simulants 57.

While it is within the scope of this invention to mount the wheels 40 to rotate independently on the axle 41, so the motions of each animal-simulant would be variable; it is preferable to have both wheels 40 secured on their common axle, and have the actuating means adjusted so one animal-simulant moves forward as the other moves rearward in each cycle of movements, viz., in each revolution of the wheels 40 and axle 41.

In the modified form shown in Figs. 1b to 4b, the simulant of a rabbit is featured as the animal-simulant; and the main unit thereof is identified by the reference character 60, this unit being hollow, arched or concavo-convex at its upper and front portions, and plane-sided at its lower and middle portions. This unit can be produced by molding from any appropriate plastic composition, preferably fibrous, as indicated in Fig. 3b. The rear leg-simulants 61 are united with the rear ground-wheels or actuating elements 62 that are secured on the rear axle 63 which is rotatably mounted in a bearing 64 (Fig. 3b) of the main frame element 65 which is an important feature of the actuating means for causing upward, downward, forward and rearward movements of the animal-simulant while also causing nature-simulating movements of the rear leg-simulants 61 and front leg-simulants 66, in combination with other features of the actuating means, as follows:

Tubular rivets 67, 68 and 69 are shown as the pivots that help to support the main unit or animal-body-simulant 60 in its various operative positions. Pivots 67 extend thru rear end-portions or thigh-portions of the unit 60 and thru apertured extensions of the rear leg-simulants and thru the respective wheels 62. The pivots 68 are seated in apertures in the breast-portion of unit 60 and in the front leg-simulants 66. The pivot 69 extends thru apertured end-extensions 70 of the front leg-simulants and thru an apertured post or upright 71 which is united with the beam or frame-element 65. A wheeled vehicle-simulant 72 is united with the rear end of the beam 65 and constitutes a part of the means to support and actuate the animal-simulant. This wheeled vehicle is also useful for carrying Easter-eggs or egg-simulants when this toy is displayed or used as an Easter-toy.

The toy may be pulled or pushed forward by any appropriate means, whether in the form here shown or in either of the previously described forms, so as to effect forward rotation of the ground-wheels. As the ground-wheels 62 roll forward, carrying therewith the rear leg-simulants 61, the latter are alternately hidden between the thigh-portions of walls 60w, and in view below said walls; the feet of said rear leg-portions passing down to positions where they appear to touch the ground or supporting surface. During a part of this downward movement of the rear feet, the pivots 67 push the rear part of the unit 60 upward; but when the pivots 67 have passed over the axle 63, they bring the rear end of unit 60 downward; and during parts of both these movements, upward and downward, the unit 60 is moved from its rearmost position to a position slightly beyond that of Fig. 2b where the pivots 67 begin to move downward and rearward until the pivots 67 are at their lowest points when the thigh-portions 60w nearly touch the supporting surface; and as the front leg-simulants are then approximately vertical, the animal-simulant then has the appearance of squatting in readiness to begin a leap forward; then as the pivots 67 move to their rearmost position they not only draw the unit 60 rearward, with respect to the beam 65, but also draw the pivots 68 rearward so as to swing the front leg-simulants back near to the wheels 62, because of their pivotal connections at 69 to the frame element or upright 71; and this long rearward swing of the front leg-simulants, in each cycle, concurrently with the rearward swing of the rear leg-simulants, while the whole device moves forward, produces resultant motion aspects very similar to those of natural running and leaping motions of an actual rabbit.

Although, in these three embodiments of the invention, there are several differences in structure and in resultant motions, they have the following features in common:

(1) In each form, the rear leg-simulants are fixedly united with the ground-wheels that actuate them;

(2) In each form, there is provided means to effect a forward lunge of the body-simulant or main unit in each cycle of its movements;

(3) In each form of the invention, the operating means produces upward and downward movements of the body-simulant or main unit.

(4) In each form, the rear leg-simulants are directly connected to the wheeled supporting frame's main supporting axle that is carried by the actuating wheels, being free from any intermediate linkage or gearing. In each form, the rear-leg-simulants include foot-simulants, viz., at 13f in Figs. 1, 2 and 3; at 26f in Figs. 1a and 2a; and at 61f in Figs. 1b and 2b.

Although these three forms are described specifically in the foregoing, I have no intention to limit my patent-protection to these forms, nor to the specific details of disclosure; for the invention is susceptible of numerous changes within the scope of the inventive ideas as herein implied and claimed.

I claim the following as my invention:

1. In a mechanically operable figure-toy, the combination that includes an animal-body-simulant comprising a front end-portion and a rear-end-portion, a frame operatively connected to the front-end-portion of said animal-body-simulant to aid in supporting the latter in a movable relation to said frame, a wheel having its center rotatably connected to said frame and having an eccentric portion pivotally connected to said rear end-portion for raising and lowering the latter, and a rear-leg-simulant fixed on said wheel and thereby rotatable from a hidden upper position behind said rear-end-portion when the latter is lowered and to an unhidden position when said rear-end-portion is raised by said eccentric portion and said rear-leg-simulant is lowered by rotation of said wheel.

2. In the combination defined by claim 1, said rear-end-portion being a simulation of a thigh of an animal and having the eccentric portion pivotally connected thereto in a proper relation to correlate said rear-leg simulant with said simulant of an animal's thigh.

3. The combination defined by claim 1, and a front-leg-simulant, said animal-body-simulant being hollow and comprising side walls and an arched upper portion and an open lower portion,

said frame having an upper portion hid between said side-walls and under said arched upper portion, and means operatively connected to said front-leg-simulant and to said upper portion of said frame so as to cause said front-leg-simulant to oscillate with respect to said animal-body-simulant when said eccentric connection causes said animal-body-simulant to raise and lower said rear-end-portion.

4. In a mechanically operated toy, the combination of an animal-simulant that includes a main body-simulant, means comprising a frame and a wheel operatively connected to said body-simulant for supporting and actuating the latter so as to effect forward and rearward movements thereof with respect to said frame, a front-leg-simulant comprising a free end, said front-leg-simulant being pivotally connected to said frame and to said body-simulant in a proper relation to cause said free end to swing forward and upward with respect to said body-simulant by each forward movement of the body-simulant and to be swung downward and rearward by each rearward movement of said body-simulant, said main body-simulant being integrally formed with a simulant of an animate rider's head and torso and shoulder, a simulant of an arm and whip pivotally connected to said shoulder, and means operatively combined with the first-said means for effecting upward and downward movements of said simulant of an arm and whip with respect to said main body-simulant.

5. In a mechanically operated toy, the combination of an animal-simulant that includes a main body-simulant, means comprising a frame and a wheel operatively connected to said body-simulant for supporting and actuating the latter so as to effect forward and rearward movements thereof with respect to said frame, and a front-leg-simulant comprising a free end, said front-leg-simulant being pivotally connected to said frame and to said body-simulant in a proper relation to cause said free end to spring forward and upward with respect to said body-simulant in consequence of each forward movement of the body-simulant with respect to said frame, also

to cause said free end to swing downward and rearward in consequence of each rearward movement of said body-simulant with respect to said frame.

6. In the combination defined by claim 5, said frame and body-simulant being mutually cooperative as a means effective to swing said free end of the front leg-simulant consecutively downward and forward and upward in consequence of each complete forward movement of said body-simulant with respect to said frame, also as a means to swing said free end consecutively downward and rearward and upward in consequence of each complete rearward movement of said body-simulant with respect to said frame.

7. In a mechanically operated toy, the combination of a main unit that includes a simulant of a racing animal's body and of an animate rider's body, the simulant of said rider's body including a shoulder-simulant, a simulant of an arm holding a projecting whip and pivotally connected to said shoulder-simulant, means operable to effect forward motion of said main unit, and means operatively combined with said simulant of an arm and with the first said means so as to simulate whipping the said animal's body with said projecting whip.

VINCENT CERINO.

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