

April 1, 1952

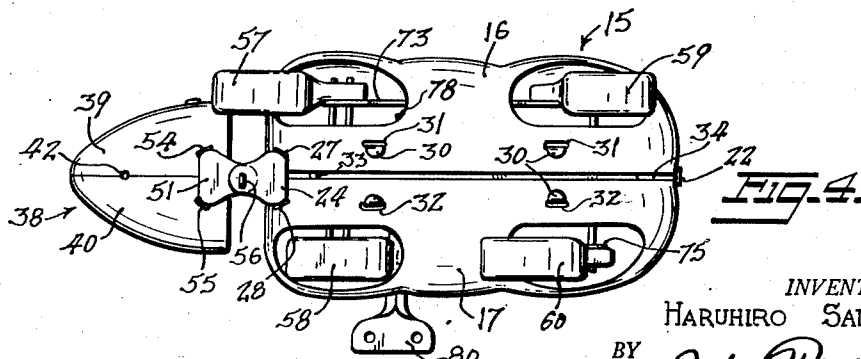
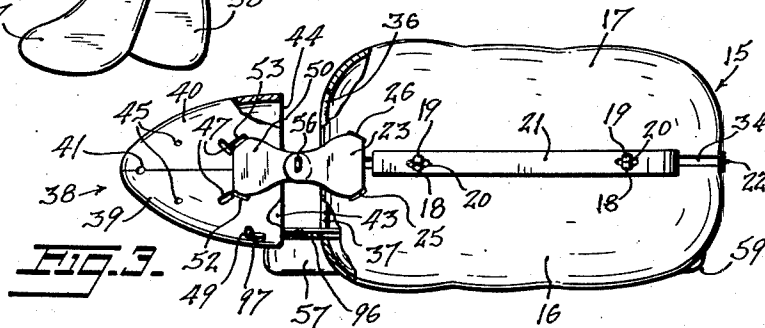
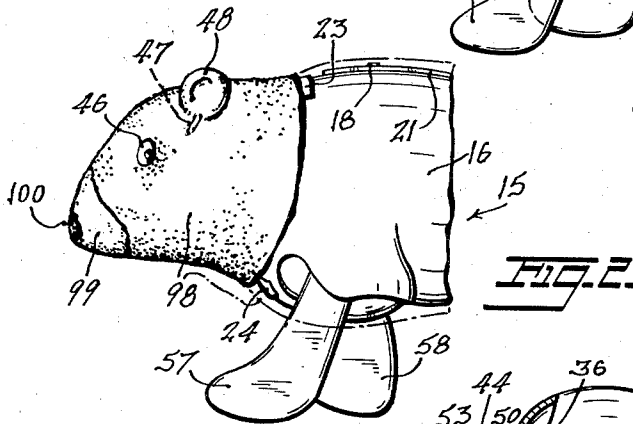
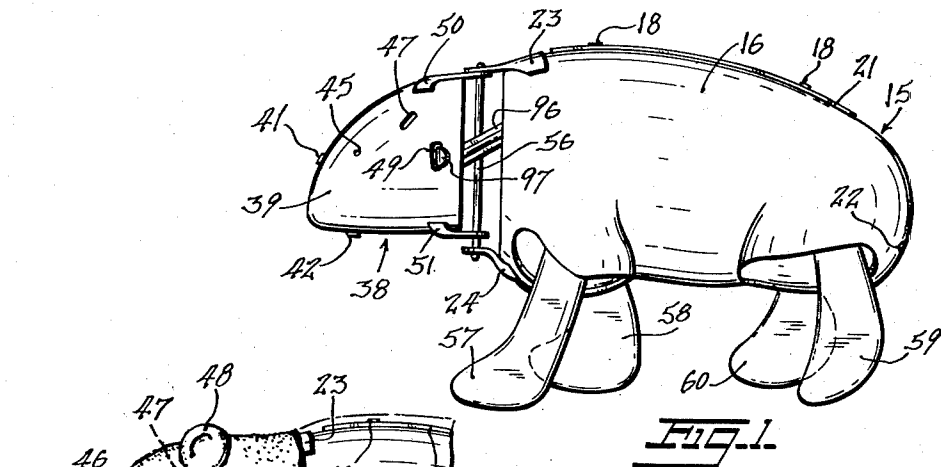
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2,591,469

ANIMATED MECHANICAL TOY

Filed Aug. 30, 1950

2 SHEETS—SHEET 1



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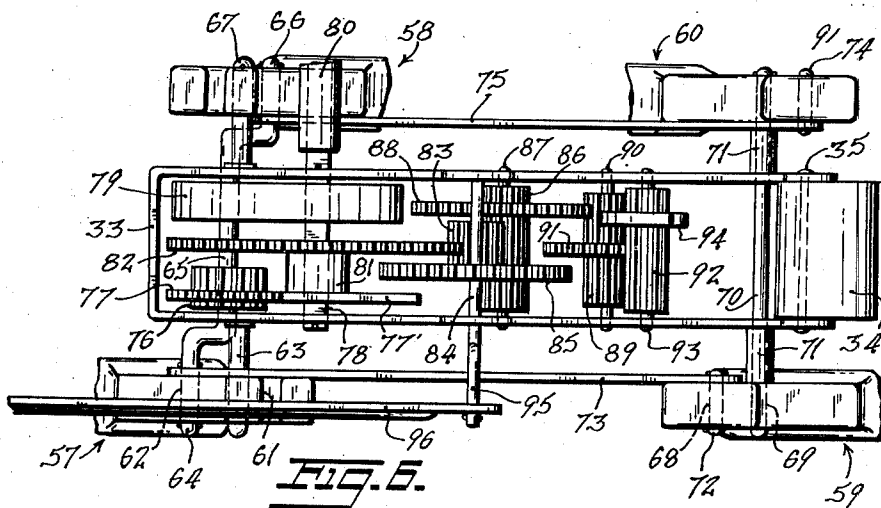
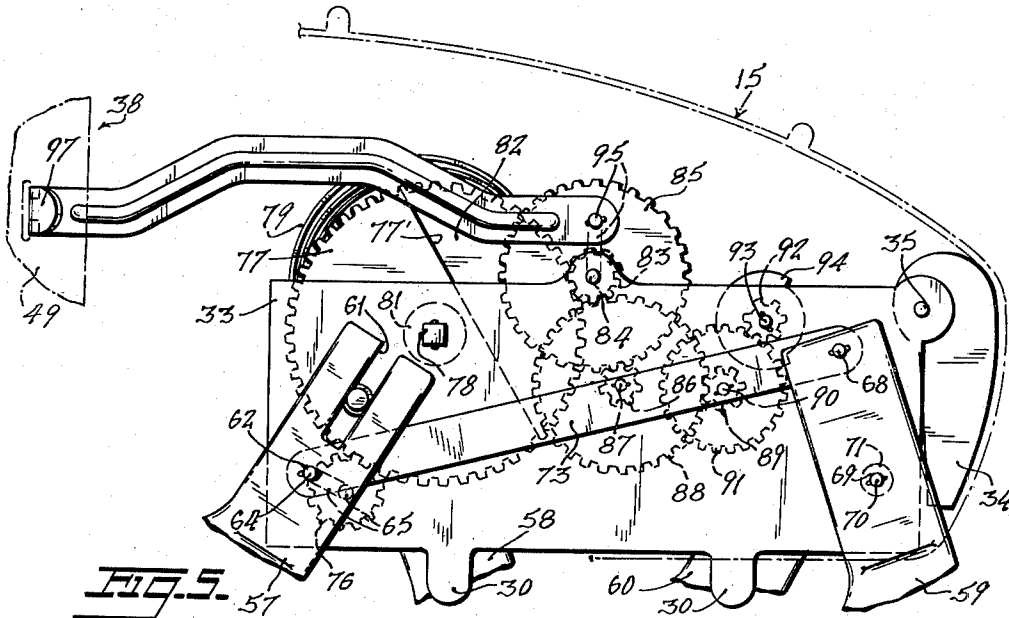
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ANIMATED MECHANICAL TOY

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2 SHEETS—SHEET 2



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ANIMATED MECHANICAL TOY

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Application August 30, 1950, Serial No. 182,196

1 Claim. (Cl. 46—120)

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This invention relates to new and useful improvements in animated toys; and, more particularly, the aim is to provide a novel and valuable mechanical toy which, representative of a four footed animal, and having four movably mounted legs and a movably mounted head, includes a mechanism, preferably of the clockwork kind including a spring functioning as the source of power drive incidental to unwinding of said spring after it has been wound, whereby the animal walks forward a predetermined distance, then stops walking for a predetermined space of time, then resumes its walking as before, then again stops walking as before, and so on.

Also, according to the invention, the head of the animal is swung first in one direction and then in the other, as from side to side, at regular intervals; this head swinging being maintained all the while the animal is intermittently and alternately walking forward and standing halted as above.

For further comprehension of the invention, and of the objects and advantages thereof, reference will be had to the following description and accompanying drawings, and to the appended claim in which various novel features of the invention are more particularly set forth.

In the accompanying drawings forming a material part of this disclosure:

Fig. 1 side elevationally shows a toy pursuant to the invention, as completed up to the point where there next would be added as the final step of manufacture a skin for enveloping the body and head structure shown in this view.

Fig. 2 is, fragmentarily, a view similar to Fig. 1, but showing said skin as so added; with said skin shown in full lines over the head structure and over a small forward part of the body structure, and with said skin extended further over said body structure as indicated in dot and dash.

Fig. 3 is a top plan view of the parts of Fig. 1, partially broken away and partially in section.

Fig. 4 is a bottom plan view of the parts of Fig. 1.

Fig. 5 is an enlarged side elevational view of a casing inside the shell constituting said body structure, with a part of said shell, and also a part of the head structure, indicated in dot and dash; said casing for containing the mechanism aforesaid and said mechanism for mounting the four legs and for carrying an operative connection between an element of the mechanism and said head structure.

Fig. 6 shows the full line parts of Fig. 5 in top plan.

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Referring now to the drawings more in detail, a body structure 15 is shown which comprises a pair of substantially identical cuplike shells 16 and 17, set with their concavities facing and secured together by tongues and slots at suitably spaced points. Thus, longitudinally of the top of the animal, the shells 16 and 17 are locked together by having tongues 18 and 19 formed thereon sent upward through and then bent over relative to slots 20 in a thin metal strip 21; the tongues 18 being integral with the shell 16 and the tongues 19 being integral with the shell 17. Said shells are further interconnected, at the tail end of the animal, as by further tongue and slot means such as indicated at 22. Said shells are further interconnected by top and bottom strap pieces 23 and 24; the strap piece 23 having tongues sent downward through and bent in below slots 25 and 26 respectively in the shells 16 and 17, and the strap piece 24 having tongues sent upward through and bent in above slots 27 and 28 respectively in said shells 16 and 17.

Longitudinally of the bottom of the animal, said shells 16 and 17 are also locked together by four tongues 30 (compare Figs. 4 and 5); two of said tongues being downwardly sent through a pair of slots 31 in the shell 16 and then bent over and two of said tongues being downwardly sent through a pair of slots 32 in the shell 17 and then bent over.

Said tongues 30 are integral with the casing aforesaid for the clockwork mechanism and associated parts; which casing is shown as incorporating a frame 33 U-shaped in top plan, closed in across its rear end by a weight 34 held in place by a rivet pin, 35.

As will be noted from Fig. 3, the shell 16 is shaped so as to present a substantially semicircular opening 36 at its forward end, and the shell 17 is similarly shaped, that it to present a substantially semicircular opening 37 at its forward end.

The head structure shown, this as a whole designated 38, is also comprised of a pair of substantially identical cuplike shells 39 and 40, set with their concavities facing and secured together by tongue and slot means at suitable points as indicated at 41 and 42. As will be noted from Fig. 3, the shell 39 is open at its rear end, there to establish a semicircular opening 43, and the shell 40 is open at its rear end, there to establish a semicircular opening 44.

Said head structure 38 is also shown as having a pair of apertures 45, each of these for use in securing a wire of the known kind as carried by

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such an artificial eye as indicated at 46 in Fig. 2; a pair of slots 47, each of these for facilitating in a familiar way the wedge anchorage of an artificial ear such as indicated at 48; and a slot 49 at a side of the shell 39 for a purpose later to be explained.

Said shells 39 and 40 of the head structure 38 are further provided with tongue and slot inter-connecting means by way of top and bottom strap pieces 50 and 51; the strap piece 50 having a pair of tongues sent downward through and bent in below slots 52 and 53 respectively in the shells 39 and 40, and the strap piece 51 having a pair of tongues sent upward through and bent in above slots 54 and 55 respectively in said shells 39 and 40.

Central extensions from the top strap pieces 23 and 50 are shaped for overlap, and central extensions from the strap pieces 24 and 51 also are shaped for overlap; all four of these extensions having apertures which are aligned when the head structure 38 is pivotally mounted to have a prevised axis of swing relative to the body structure 15; and this pivotal mounting is provided by a wire pivot member 56 sent through all said apertures and given offset bends as shown at its upper and lower ends.

The left fore leg is as a whole marked 57, the right fore leg is as a whole marked 58, the left hind leg is as a whole marked 59 and the right hind leg is as a whole marked 60. These legs, at their feet and feet-adjacent portions, are of increased width, as shown, relative to their upper slenderized more or less plate-like portions; said legs being desirably of hollow construction, for lightness of weight, as by being made of suitably interconnected shell members of thin metal or plastic.

For permitting movement of the legs while the animal is walking, openings as shown best in Fig. 4, are provided in the bottoms of the shells 16 and 17.

The two fore legs 57 and 58 are exactly alike in construction; each of these legs having a bifurcated upper end to provide a slot and also having an aperture at a point below and in line with said slot. In Figs. 5 and 6, in the case of the left fore leg 57, said slot is designated 61 and said aperture 62. Engaged in the slot 61 is a pin 63 rigidly offset from the casing 33, and journaled in the aperture 62 is one crank-arm end, 64, of a cross shaft 65.

The mounting of the right fore leg 58 is, as shown at the upper part of Fig. 6, exactly like that of the left fore leg 57, except that there is journaled in the aperture of the leg 58 corresponding to the aperture 62 a crank-arm end, 66, of the cross shaft 65 which is offset 180° from said crank-arm end 64 of said shaft. A pin 67 rigidly offset from the side of the casing 33 adjacent to the leg 58 corresponds to the pin 63 for coaction with said leg 58 as the pin 63 coacts with the leg 57.

The two hind legs 59 and 60 also, are exactly alike in construction; each of these legs having therethrough at its upper end an upper aperture and a lower aperture. In Figs. 5 and 6, in the case of the left hind leg 59, said upper aperture is designated 68 and said lower aperture 69. Extended through the casing 33 is a cross pivot pin 70, carrying beyond each of the opposite sides of said casing a spacing sleeve 71; one end of said pin, beyond a sleeve 71, extending through said aperture 69 and the opposite end of said pin, beyond the other sleeve 71, extending

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through the lower aperture of the leg 60. Mounted in the aperture 68 is a pivot pin 72; and connecting the crank-arm end 64 and said pin 72 is a link 73.

The mounting of the right hind leg 60 is, as shown at the upper part of Fig. 6, exactly like that of the left hind leg 59. As just above already stated, the cross pivot pin 70 mounts the said leg 60 as well as the leg 59; while, on said leg 60, there is mounted a pivot pin 74 which in placement and function corresponds to the pivot pin 72; and connecting this pivot pin 74 and the crank-arm end 66 is a link 75.

As will now be clear, during rotation of the shaft 65, in a counter-clockwise direction as viewed in Fig. 5, the crank-arm end 64 of said shaft will cause the left fore leg 57 at a point thereon defined by the axis of the aperture 62 to travel in a counter-clockwise direction through a circular path about the axis of the main central length of the shaft 65 causing the leg to move downward when inclined forward and to move upward when inclined rearward. Due to the accompanying action of the stationary pin 63 relative to the slot 61 in the leg 57, the lower end of the leg is moved backward during most of the travel of the crank-arm end 64 over the lower half of its path of circular travel in forward propelling tractive relation to the supporting surface on which the animal is placed. During most of the travel of the crank-arm end 64 the upper half of its path of circular travel, the lower end of the leg 57 is raised and moved forward out of tractive relation to said supporting surface.

This alternately occurring entry of the leg 57 into and out of tractive relation to said supporting surface, according, respectively, as said leg is being swung backward or forward, takes place as just above described, because while the said leg 57 is being swung backward the right fore leg 58 is being swung forward, and vice versa, due to the crank-arm end 66 being offset 180°, as aforesaid, from the crank-arm end 64. And due to said 180° offset as between the crank-arm ends 64 and 66, while the left fore leg 57 is being swung backward the right fore leg 58 is being swung forward, and vice versa.

Meanwhile, due to the connections effected by the links 73 and 75 between, respectively, the left fore and hind legs 57 and 59, and the right fore and hind legs 58 and 60, as a fore leg reaches the extreme limit of its forward swing the hind leg at that side of the animal reaches the extreme limit of its rearward swing, and vice versa. In this connection, note that, in the case of the link 73, for example, its forward end is connected to a fore leg at a point thereon below a fixed pivotal mount (the pin 63) for said fore leg, while the rear end of said link is connected to the associated rear leg at a point thereon above a fixed pivotal mount (the pin 70) for said rear leg.

Fixed on the shaft 65 carrying the two crank-arm ends 64 and 66 is a spur pinion 76, and for intermittently causing said pinion to revolve a predetermined plurality of times, a gear segment 77, having a secantially extended straight edge 77', is meshable with said pinion; said gear segment being fixed on a main shaft 78 arranged to be rotated in a clockwise direction as viewed in Fig. 5 during unwinding of a spring 79. Said shaft 78 carries a winding key 80, whereby said spring may be manually wound.

Unwinding of said spring 79, in addition to being effective as already described, and particu-

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larly by way of rotation of the gear segment 77, for causing the animal to walk forward a predetermined distance, then to stop walking for a predetermined interval of time, then to resume its walking as before, then again to stop walking as before, and so on, is further effective to cause swinging of the head of the animal from side to side, first in one direction and then in the other, at regular intervals, while the animal has stopped walking temporarily and also while it is walking; while the clockwork mechanism also incorporates a collection of parts to retard the rate of unwinding of the spring to an ideal extent, all as will be clear from what now follows.

Fixed on said shaft 78, and spaced from the gear segment 77 by a collar 81, is a spur gear 82 meshing with a pinion 83 fixed on a shaft 84. Also fixed on said shaft 84 is a spur gear 85; this gear meshing with a pinion 86 fixed on a shaft 87. Also fixed on said shaft 87 is a spur gear 88 meshing with a pinion 89 fixed on a shaft 90. Also fixed on said shaft 90 is a spur gear 91 meshing with a pinion 92 fixed on a shaft 93; and also fixed on said shaft 92 is an air-friction speed retarder member 94.

One end of the shaft 84 is formed to include a crank arm 95, and to this crank the rear end of a link 96 is connected. The forward end of said link is also connected, rockably, to a side of the head structure 38; such connection as herein shown being by way of the aforesaid slot 49 at a side of the shell 39. To effect this connection, the forward end portion of the link 96 is extended through said slot, and then bent and oppositely crimped to establish such a coupling formation as indicated at 97 in Fig. 5.

Thus, in prevised timed relation to the speed of walking of the animal, the animal's head is wagged or swung slowly from side to side; this head movement continuing as well during the times that the animal is not walking.

In addition to eyes such as the one indicated at 46, and ears such as the one indicated at 48, the head of the animal is enveloped in a suitable skin, such as that shown at 98 Fig. 2 and there having the muzzle and snout or nose markings 99 and 100. This skin may be of any suitable material, as plush or the like, to represent a coat of fur. It may be a single enveloping skin for the head and the body, as indicated in dot and dash in Fig. 2; with sufficient fullness at the animal's neck to permit the described wagging of the animal's head. Or there may be an elastically stretchable insert in said envelope at and around, or at opposite sides of, the neck location. Or there may be an enveloping skin for the animal's head, and another enveloping skin for the animal's body, with one of these skins overlapping the other at the neck location.

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While I have illustrated and described the preferred embodiment of my invention, it is to be understood that I do not limit myself to the precise construction herein disclosed and the right is reserved to all changes and modifications coming within the scope of the invention as defined in the appended claim.

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

A walking toy simulating a four-legged animal, comprising a figure shaped to represent the body of said animal, individually movable fore legs and hind legs depending from said body and representative of the animal's legs, a motor driving a segmental gear, means for simultaneously oppositely moving each pair of hind legs and fore legs relative to a supporting surface on which the animal is placed thereby to cause the toy to walk by a tractive backward swing first of one fore leg and then of the other fore leg relative to said surface, a mounting means for each of said fore legs near its upper end, said mounting means in the case of each of said fore legs including a slot at the upper portion of said leg extended generally longitudinally thereof, a fixed pin engaging said slot, a crank arm revolvably connected to said upper leg portion at a point below the lower end of said slot, a crank shaft from which said crank arms are offset 180° one from another to cause one fore leg to move forward while the other moves rearward and vice versa, and a pinion on said crank shaft meshing with said segmental gear to cause said crank shaft to be turned during one part of the rotation of said segmental gear and to be non-rotative during the remaining portion of the rotation of said segmental gear to intermittently operate said legs to cause the animal to alternately walk and stand still.

HARUHIRO SAITO.

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