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3,238,665

MOVABLE ELEMENT WHEELED ACTION TOY

Original Filed March 6, 1961

3 Sheets-Sheet 1

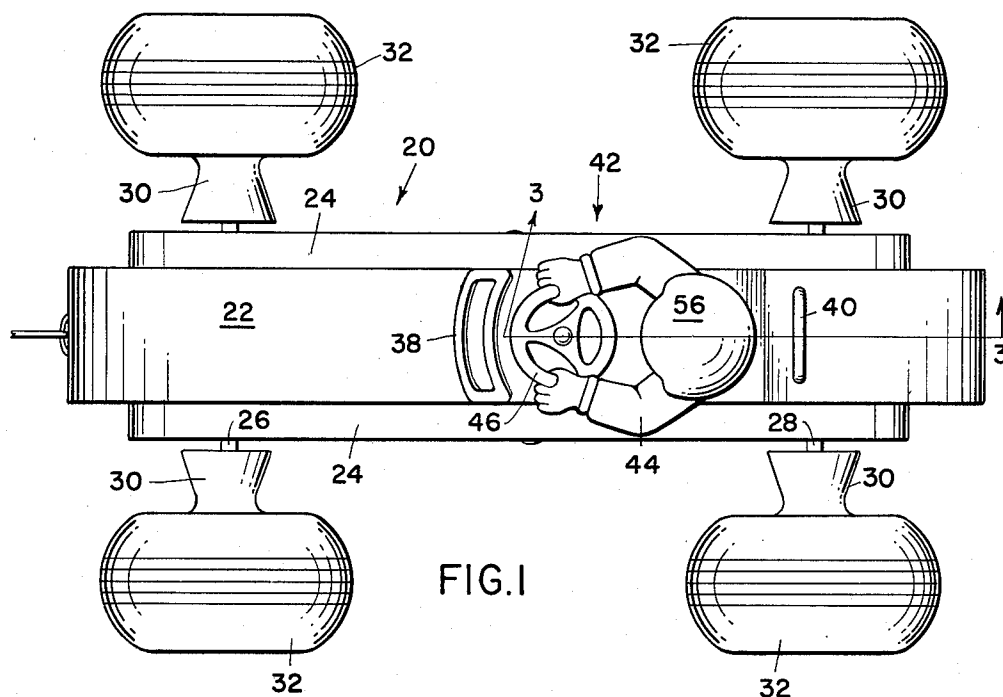


FIG.1

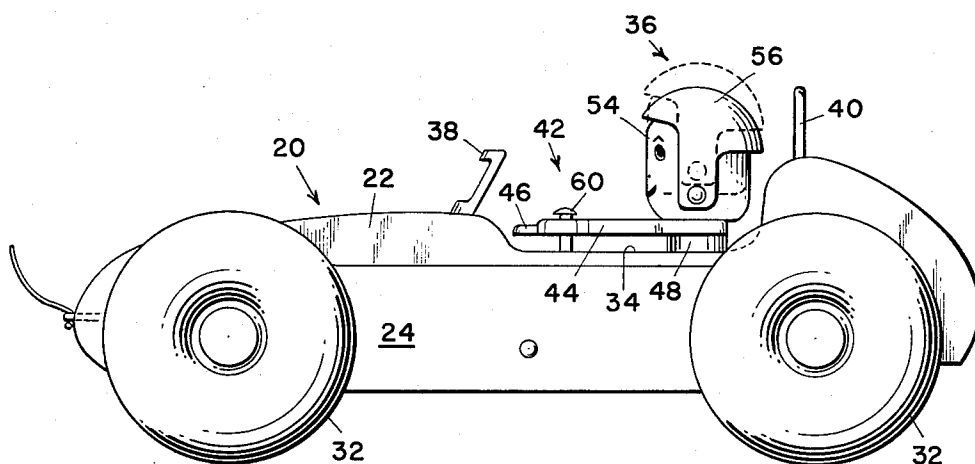


FIG. 2

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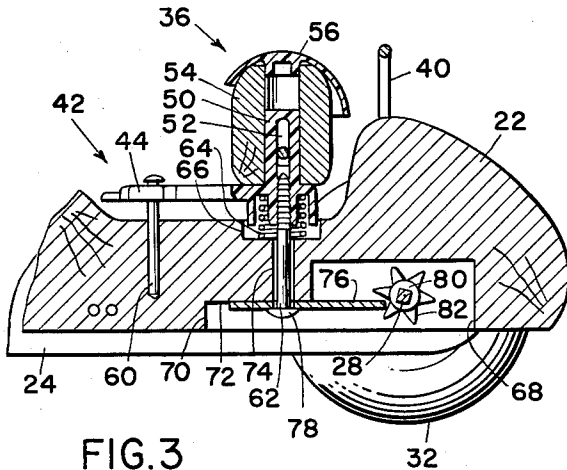


FIG.3

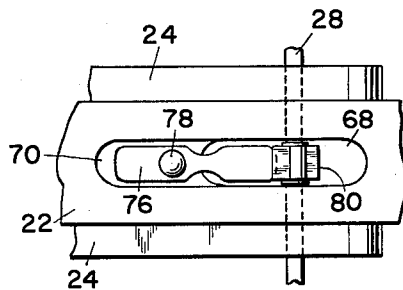


FIG.4

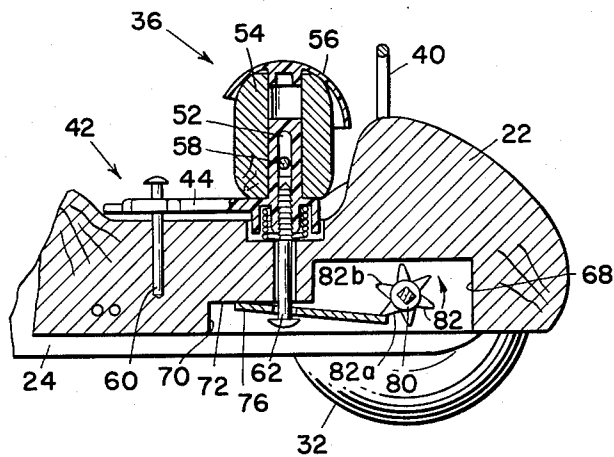


FIG.5

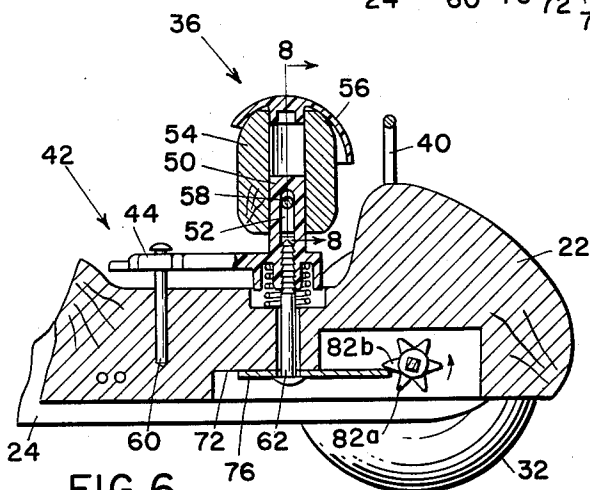


FIG. 6

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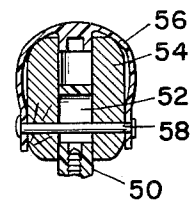
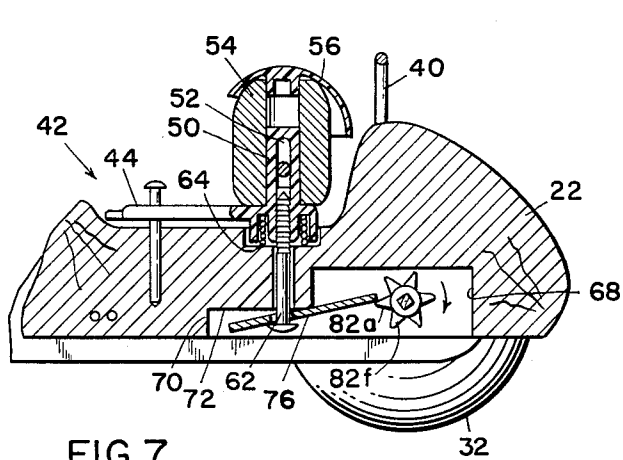
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3 Sheets-Sheet 3



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MOVABLE ELEMENT WHEELED ACTION TOY

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Continuation of application Ser. No. 93,401, Mar. 6, 1961. This application June 22, 1964, Ser. No. 379,762
9 Claims. (Cl. 46-107)

This application is a continuation of my copending application Ser. No. 93,401, filed March 6, 1961 for "Action Toy" now abandoned.

This invention relates to action toys, and more particularly to toys of the type designed to be pulled or pushed across a supporting surface, such as a floor or the like, and having elements thereof which, when actuated in response to such movement, produce a pleasant action or movement of certain parts of the toy and at the same time produce a regular and pleasant sound, one object of the invention being to provide an improved toy of the above nature.

Another object is to provide a toy of the above character which will produce the foregoing action and sounds when it is moved backwardly as well as when it is moved forwardly.

Another object of the invention is to produce a toy having the above advantages in which the action producing mechanism is simpler and easier to construct and more reliable and durable than mechanisms heretofore known.

Another object is to provide a toy of the above character in which certain parts are caused to move in unison and also relative to one another, thereby producing a more varied and interesting action than would otherwise be possible.

Another object is to provide a toy having the above advantages which will produce the desired sound effects in conjunction with imparting the desired action to the movable members as the toy is moved either forwardly or backwardly.

In the past, sound producing mechanisms have been used in which a spring finger was made to alternately move into and out of contact with a sounding member as by means of a gear or the like mounted on a shaft or other rotating part. However, these devices have not been particularly satisfactory because the positioning of the spring was critical, and in normal play, the device was often thrown out of adjustment and did not work satisfactorily. In addition to the disruption of the mechanism resulting from normal play, children were intrigued by the mechanism, and in examining the same, often managed to put it out of commission. A further disadvantage of these devices was the difficulty in shielding the device so that a child could not pinch his fingers or cut or scratch himself against the sharp edges of the spring.

Another object is to provide a toy in which the sound producing mechanism does not require the usual elongated spring member, is tamper-proof and reliable in operation, and which may be poked at and freely examined by children, without damaging the mechanism or throwing it out of adjustment.

Another object is to provide a toy of the above character in which the sound producing mechanism is free from sharp projections, rough or otherwise potentially dangerous parts and is so constructed that a child cannot pinch and wedge his fingers in playing with the mechanism, and therefore, is safe for use by young children.

Another object is to provide a toy having the above advantages in which the sound producing mechanism does not utilize the usual elongated spring member.

Another object is to provide a toy having the above advantages which is durable, reliable in operation, and re-

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quires a minimum number of parts which may be readily and economically manufactured and assembled.

To these and other ends the invention resides in certain improvements and combinations of parts all as will be hereinafter more fully described, the novel features being pointed out in the claims at the end of the specification.

In the drawings:

FIG. 1 is a top plan view of a toy embodying the present invention;

FIG. 2 is a side elevation of the toy shown in FIG. 1;

FIG. 3 is a fragmentary sectional elevation substantially along the line 3-3 in FIG. 1, showing the action and sound producing mechanism;

FIG. 4 is a fragmentary bottom plan view of portions of the actuating mechanism shown in FIG. 3;

FIG. 5 is a fragmentary sectional elevation similar to FIG. 3, but showing the actuating mechanism at substantially its fully depressed position;

FIG. 6 is similar to FIG. 4, and shows the actuating mechanism in its normal position with the action members separated;

FIG. 7 is similar to FIG. 5, and shows the position of the actuating mechanism when the toy is moved in a direction opposite to that illustrated in FIG. 5;

FIG. 8 is a sectional elevation substantially along the line 8-8 in FIG. 6, showing the details of the head or second action member;

The preferred embodiment of the present invention, herein disclosed by way of illustration, is represented in the form of a small wheeled vehicle such as a race car shown generally at 20, wherein the head and portions of the driver's body are caused to move as the toy is propelled. However, it will be readily understood that the invention may be incorporated in any suitable type of wheeled toy and utilized to actuate any desired portion of the toy, racer 20 merely being shown for the purposes of illustration.

Racer 20 preferably comprises a base or body portion 22 (FIG. 1) of wood or other suitable material which is shaped as shown in the drawings to give the desired appearance. Body portion 22 has side panel members 24 secured thereto as by nails or other suitable means, although if desired, members 22 and 24 may be formed from a single block of wood or may comprise a single plastic member. Racer 20 is provided with front and rear axles 26 and 28, respectively, which are mounted in suitable holes (not shown) in body members 22 and 24. Axles 26 and 28 have wheel or hub members 30 fastened to the opposite ends thereof. Hub members 30 are preferably of wood or other suitable material and in turn are adapted to receive and securely engage resilient tire members 32, which are of rubber, polyethylene or other suitable plastic material.

The upper surface of body member 22 is formed with a recessed portion 34 which simulates the cockpit of the racer and in which a simulated figure of a driver shown generally at 36, is positioned for movement, as hereinafter more fully described. A small windshield 38 (FIGS. 1 and 2) of plastic or other suitable material is mounted adjacent the forward edge of the cockpit, while a "roll-over" bar 40 of metal or the like is positioned at the rear of the cockpit.

Driver 36 preferably comprises a first action portion shown generally at 42 (FIG. 2) which is shaped to simulate the shoulders and arms 44 of the driver and steering wheel 46 of the vehicle. Member 42 is formed with a depending circular flange 48 (FIG. 3) adjacent the rear portion thereof and an upwardly extending boss 50. Boss 50 is formed with a transversely extending slot 52 (FIGS. 3, 7 and 8) which terminates short of the upper end thereof for receiving a simulated figurehead 54 which

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is preferably of wood or other suitable material. A plastic helmet 56 is secured to head 54 by means of a transversely extending rod or rivet 58 (FIG. 8) which also extends through slot 52 in boss 50 thereby mounting head 54 on boss 50 for limited vertical movement relative thereto as shown by a comparison between FIGS. 5 and 6. Head 54 forms a second action member and will be caused to move with and relative to first action member 42 by means hereafter described.

Action member 42 is held in position on the toy by means of a limit pin or nail 60 (FIG. 3) which extends through the center of the steering wheel as shown in FIGS. 1 and 3, and by a vertically extending pin or rod 62 (FIG. 3) which extends upwardly through a portion of body member 22, forwardly of rear axle 28, as shown in FIGS. 3, 5 and 6. Pin 62 is preferably formed with a series of serrations or ridges adjacent the upper end thereof and is adapted to be driven or otherwise forced into engagement with action member 42 and to securely grip the same. A coil spring 64 (FIG. 3) is positioned within flange 48 and bears at one end against a recess 66 formed in body portion 22, and at the other end against the undersurface of action member 42, as shown in FIG. 3. Spring 64 urges action member 42, head portion 54 and associated parts upwardly to their positions shown in FIG. 3.

Body member 22 is formed with a recess 68 (FIGS. 3, 5-7) adjacent the center thereof and adjacent the area through which rear axle 28 extends. Recess 68 extends upwardly above the axle, as well as forwardly and rearwardly thereof as shown in FIG. 4. A second recess 70 is formed forwardly of recess 68 and interconnects therewith at a point forwardly of the rear axle. Recess 70 is not as deep as recess 68, and thereby leaves an abutment or bearing surface 72 forward of axle 28 for the purpose hereafter described.

A hole 74 (FIG. 3) extends upwardly through abutment 72 and terminates adjacent the center of recess 66. Hole 74 is adapted to loosely receive pin 62 and is slightly larger in diameter than the pin. Pin 62 extends downwardly through hole 74 and through an oversize hole in a rocking lever or bar 76 (FIGS. 3-7) at a point between the ends of the lever. Pin 62 is formed with an enlarged head portion 78 (FIGS. 3 and 8) at the lower end thereof for holding the pin in position and preventing lever 76 from moving out of engagement therewith.

When the parts are in their normal or first positions, spring 64 acts against the underside of action member 42 and holds the same upwardly in substantially its position shown in FIG. 3. Pin 62 extends into member 42 for a sufficient distance so that when member 42 is in its at-rest position, head 78 of pin 62 securely engages the undersurface of lever 76 and holds the same in a substantially horizontal position as shown in FIGS. 3 and 6.

Rear axle 28 is preferably square in cross section and has a member, such as gear 80 mounted thereon. Gear 80 is formed with a square opening extending there-through and is adapted to so fit on axle 28 that rotation of the axle causes the gear to rotate therewith. Member 80 may be of any desired configuration, other than circular, and is preferably formed with a series of teeth or shoulder portions 82 which extend at a greater radial distance than the intervening portions. Although member 80 may be of any desired external configuration, other than circular, shoulder portions 82 must be spaced peripherally in order for the actuating and sound mechanism to operate, and I preferably form member 80 in the shape of a multi-pointed gear with a limited number, such as six or eight, teeth substantially evenly spaced therearound.

As the top is moved forwardly across a supporting surface, the wheels are caused to move in a counterclockwise direction thereby moving gear 80 in a counterclockwise direction, as shown by the arrow in FIG. 5. Lever 76 is of sufficient length that the rearward edge thereof lies in the path of movement of teeth 82 so that the rotation of

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the wheels and gear 80 causes the lever to be moved downwardly from its position shown in FIG. 3 to substantially its position shown in FIG. 5, at which point only the forward end of the lever bears against abutment 72. This downward movement of lever 76 pulls pin 62 downwardly which in turn moves action member 42 and head member 54 downwardly from their first positions shown in FIG. 3 to their second positions shown in FIG. 5 against the action of spring 64. As gear 80 continues to rotate in a counterclockwise direction, tooth 82a moves out of contact with lever 76, which quickly returns to its position against abutment 72 and the base of tooth 82b, as shown in FIG. 6, through the action of spring 64 moving action member 42 and head 54 upwardly. The upward movement of action member 42 is limited by either pin 62 acting against lever 76 which in turn bears against abutment 72 or by limit pin 60, or both. However, due to the mass of head 54, and associated parts, the head moves upwardly away from action member 42 as shown in FIG. 6. This upward movement of head 54 is limited only by the action of gravity and the length of slot 52 in boss 50.

In any event, arm portions 42 are given a regular and reciprocating movement through the rotation of the wheels as the toy moves forwardly across a supporting surface. In addition, head 54 moves upwardly away from the action member 42 and then returns into contact therewith.

When the toy is moved rearwardly across a supporting surface, the wheels, and consequently gear 80, are moved in a clockwise direction shown by the arrow in FIG. 7. Teeth 82 of gear 80 engage the rear end of lever 76 and rather than lowering the rear end thereof, the teeth will raise the same as shown in FIG. 7. This movement of lever 76 causes the same to tilt upwardly towards the rear against the rearward edge of abutment 72 and pulls pin 62 downwardly, as shown in FIG. 7. This downward movement of pin 62 in turn moves action member 42 and head 54 downwardly against the action of spring 64. As the wheels are turned further in a clockwise direction, tooth 82a moves out of contact with the rear end of bar 76, thereby releasing the same and allowing it to return to its normal, at-rest position shown in FIGS. 3 and 6. This quick release of lever 76 allows action member 42 to quickly move upwardly to its first position where it is stopped. In the same manner as described earlier in connection with the action shown in FIGS. 5 and 6, head 54 moves on upwardly along boss 50 to a position substantially as shown in FIG. 6. Of course, as the rearward movement of the toy continues, this same tilting and subsequent quick releasing of member 76 continues, thereby continuing to impart the above impetus to the action members, as described above.

In addition to providing the desired action of the parts described above, my device also produces a pleasant and regular series of sounds, which simulate engine and automobile noises and are desirable in a vehicle of this type. That is, as lever 76 returns to its position shown in FIGS. 3 and 6 in contact with abutment 72, and the next tooth 82b of gear 80, a sound is produced. Further sounds are produced as head 54 is caused to move away from and back into contact with action member 42. This latter action produces a double series of rather sharp clicking sounds, but of course the volume and tone of the sounds may be varied by varying the relative mass of action member 42 and head 54 as well as varying the materials from which they are made, and by other obvious means, such as inserting a cushioning member between the two, and the like.

Thus, my invention provides an improved actuating and sound producing mechanism which operates when the wheels are rotated in either direction and which has a minimum number of parts which may be readily and quickly manufactured and assembled. In addition, my improved mechanism provides not only a first actuating member, but it has a second actuating member which, while it moves in one direction with the first member, is

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capable of moving independently beyond the limit of movement of said first member in a second direction and which provides fascinating action as the toy is moved along a supporting surface, such as a floor or the like. Further, my above mechanism provides an interesting realistic sound concurrently with the action of the parts described above. The sound producing mechanism operates without the intervention of leaf springs, as heretofore has been necessary, and produces the desired type of sound while the toy is propelled.

It will thus be seen that the invention accomplishes its objects and while it has been herein disclosed by reference to the details of preferred embodiments, its to be understood that such disclosure is intended in an illustrative, rather than a limiting sense, as it is contemplated that various modifications in the construction and arrangement of the parts will readily occur to those skilled in the art, within the spirit of the invention and the scope of the appended claims.

I claim:

1. In an action toy having a body, wheels, and an axle that is rotatable in response to movement of said toy over a supporting surface, the improvement comprising: a first action member forming a visibly moving portion of said toy and mounted for generally vertical reciprocatory motion toward and away from a first upper limit of motion; resilient means for urging said first action member towards said first upper limit of motion; a lever operable in response to rotation of said axle for moving said first action member away from said first upper limit of motion against the bias of said resilient means and for releasing said first action member for rapid upward movement under the influence of said resilient means toward said first upper limit of motion; and a second action member connected to said first action member by a lost motion coupling, said second action member forming a second visibly moving portion of said toy and being slidable generally vertically relative to said first action member to a second upper limit of motion elevated above said first upper limit of motion, said second action member being movable with said first action member away from and toward said first upper limit of motion, and said rapid movement of said first action member toward said first upper limit of motion impelling said second action member to overtravel upward beyond said first upper limit of motion toward said second upper limit of motion.

2. A toy according to claim 1 wherein said first and second action members are provided with interacting means whereby periodic contact between said first and second action members produces temporally related percussion noises.

3. A toy according to claim 2 wherein said lever is cooperable with a toothed gear fixed to said axle and arranged for imparting said vertical motion to said first action member upon both backward and forward motion of said toy.

4. In an action toy having a body, wheels, and an axle that is mounted for rotation in response to movement of said toy over a supporting surface, the improvement comprising: a first action member forming a visibly moving portion of said toy and mounted for generally vertical reciprocatory movement; a generally vertically disposed rod connected to said first action member; stop means for limiting the upward motion of said first action member; resilient means for urging said first action member toward said stop means; a toothed gear fixed to said axle for rotation therewith; lever means cooperable with said rod and operable in response to rotation of said toothed gear for moving said rod and said first action member away from said stop means against the bias of said resilient means and for releasing said rod and said first action member for rapid upward movement under the influence of said resilient means toward said stop means; and a second action member connected to said

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first action member by a lost motion coupling whereby said second action member is slidable vertically relative to said first action member to an upper limit of motion controlled by said lost motion coupling, said second action member forming a visibly moving portion of said toy and being movable with said first action member away from and towards said stop means, and said rapid upward movement of said first action member towards said stop means impelling said second action member to overtravel upward beyond said stop means toward said upper limit of motion.

5. A toy according to claim 4 wherein said first and second action members are provided with interacting means whereby periodic contact between said first and second action members produces temporally related percussion noises.

6. A toy according to claim 5 wherein said first and second action members simulate portions of a movable figure.

7. In an action toy having a body, wheels, and an axle that is mounted for rotation in response to movement of said toy over a supporting surface, the improvement comprising: a first action member forming a visibly moving portion of said toy and mounted for generally vertical reciprocatory movement; a generally vertically disposed rod connected to and movable with said first action member; stop means cooperating with means on said rod for limiting the upward motion of said rod and said first action member; resilient means for urging said rod and said first action member toward said stop means; a toothed gear fixed to said axle for rotation therewith; lever means cooperable with said rod and operable in response to rotation to said toothed gear for moving said rod and said first action member away from said stop means against the bias of said resilient means and for releasing said rod and said first action member for rapid upward movement under the influence of said resilient means toward said stop means; and a second action member connected to said first action member by a lost motion coupling whereby second action member is slidable vertically relative to said first action member to an upper limit of motion controlled by said lost motion coupling, said second action member forming a visibly moving portion of said toy and being movable with said first action member away from and toward said stop means, and said rapid upward movement of said first action member towards said stop means impelling said second action member to overtravel upward beyond said stop means toward said upper limit of motion.

8. A wheeled action toy simulating a car and driver and comprising a body, at least one axle that is mounted for rotation on said body, wheels mounted on said axle for supporting said toy for movement over a supporting surface, said body being formed with a generally upright bore and with abutment means disposed at the lower end of said bore, a rod that is mounted in said bore for sliding, reciprocatory, up and down movement therein relative to said body, said rod being formed at its lower end with an enlarged diameter portion forming stop means and cooperating with said abutment means to limit the upward movement of the rod relative to the body, a first action member simulating the arms and hands of a driver grasping a steering wheel for the car, said action member being secured to the upper end of the rod above the upper surface of the body for movement upon movement of the rod, a generally upright pin that is mounted to project from said body ahead of said first action member, said first action member being formed with an opening at the center of the simulated steering wheel through which said pin projects, said pin and said opening being formed to permit sliding, up and down movement of said first action member relative to the pin and to limit angular movement of said first action member and rod relative to said body, spring means mounted about the rod and interposed between said first action member and

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said body constantly to urge said rod and said first action member upwardly, a second action member that is mounted on said first action member, and that is formed to simulate the head of a driver of the car, lost motion means interconnecting said first and second action members to permit limited movement of said second action member relative to said first action member, a toothed member that is mounted on said axle for rotation on rotation of the axle, and a lever that is formed with an opening intermediate its ends and that is disposed with the lower end of said rod passing through said opening, said opening being proportioned to permit limited sliding movement of the lever relative to the rod intermediate said abutment means on said body and said stop means at the lower end of the rod, said lever having one of its ends disposed to be engaged by said toothed member upon rotation of said axle, to cause an up and down movement of said rod, to cause reciprocatory movement of said action members, and to permit overtravel of said second action member relative to said first action member and relative to said rod.

9. A wheeled action toy comprising a body, at least one axle that is mounted for rotation on said body, wheels mounted on said axle for supporting said toy for movement over a supporting surface, said body being formed with a generally upright bore and with abutment means disposed at the lower end of said bore, a rod that is mounted in said bore for sliding, reciprocatory, up and down movement therein relative to said body, said rod being provided adjacent its lower end with stop means cooperating with said abutment means to limit the upward movement of the rod relative to the body, a first

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action member secured to the upper end of the rod above the upper surface of the body for movement upon movement of the rod, spring means mounted about the rod and interposed between said first action member and said body constantly to urge said rod and said first action member upwardly, a second action member that is mounted on said first action member, lost motion means interconnecting said first and second action members to permit limited movement of said second action member relative to said first action member, a toothed member that is mounted on said axle for rotation on rotation of the axle, and a lever that is formed with an opening intermediate its ends and that is disposed with the lower end of said rod passing through said opening, said opening being proportioned to permit limited sliding movement of the lever relative to the rod intermediate said abutment means on said body and said stop means at the lower end of the rod, said lever having one of its ends disposed to be engaged by said toothed member upon rotation of said axle, to cause an up and down movement of said rod, to cause reciprocatory movement of said action members, and to permit overtravel of said second action member relative to said first action member and relative to said rod.

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