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**[54] TOY ROBOT**  
**25 Claims, 13 Drawing Figs.**

[52] **U.S. Cl.**..... 46/247,  
46/119, 46/148, 46/244  
[51] **Int. Cl.**..... A63h 33/26  
[50] **Field of Search**..... 46/243-  
—247, 106—107, 212, 104, 119—120, 148

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**ABSTRACT:** A toy robot having a self-reversing mechanism and a first arm for automatically simulating a karate chop when the second arm is moved slightly. The self-reversing operation is accomplished by the provision of pins depending from the bottom of the robot which reverse the motor circuit when they engage obstructions placed in the path of the robot. The arm operation is accomplished by rotating the right arm, thereby winding up a spring, and cocking it in a raised position. The cocking mechanism is released to allow the spring to force the right arm downward when the left arm is moved slightly.

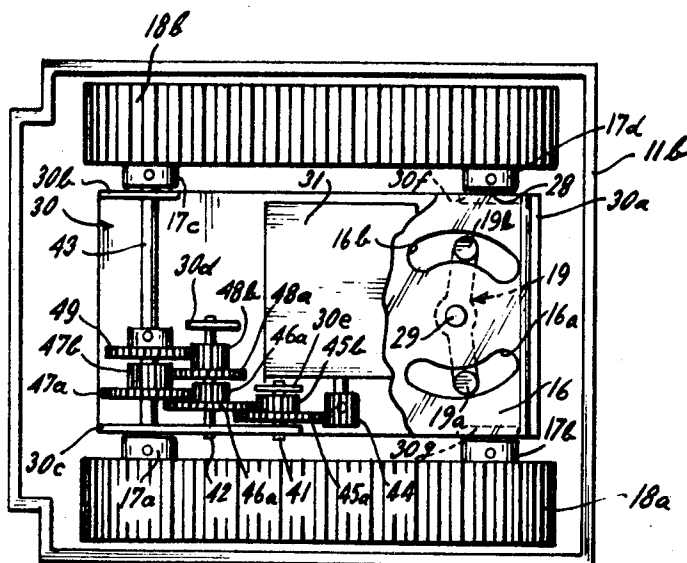


FIG. 1.

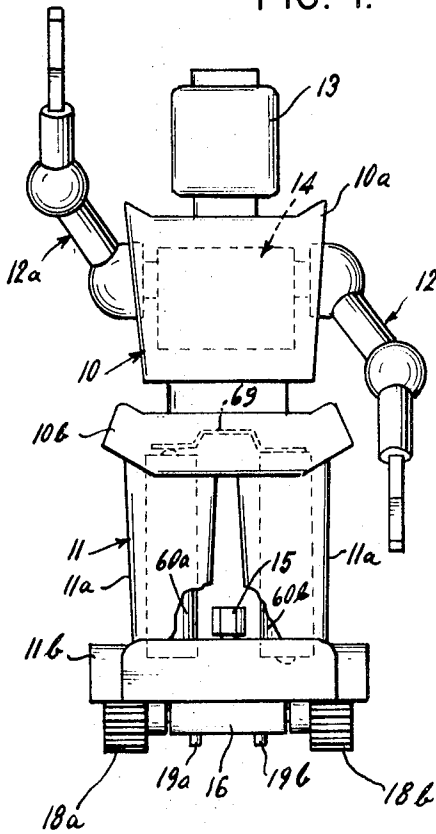


FIG. 2.

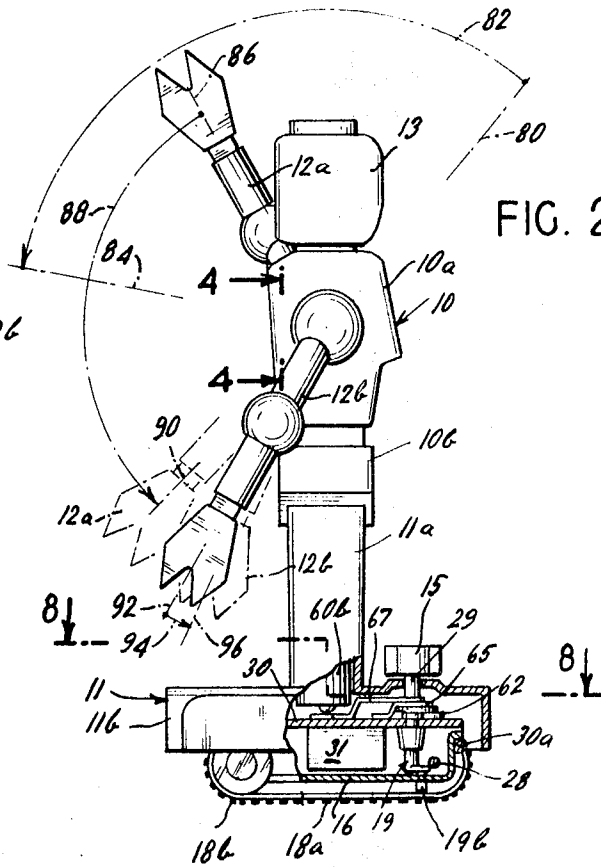
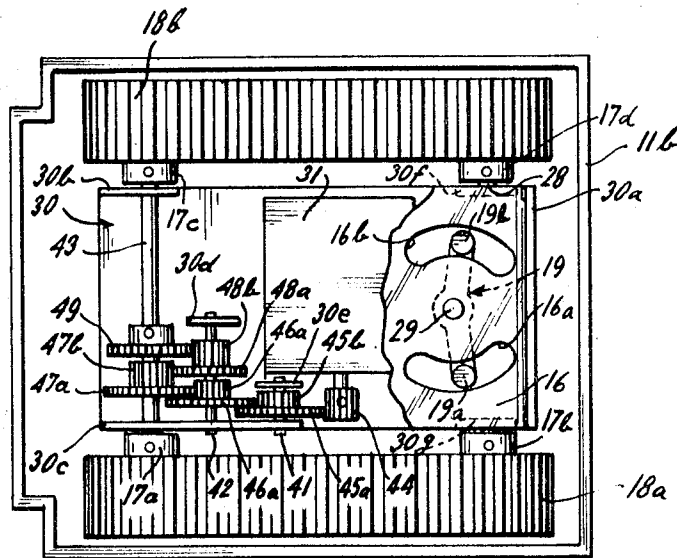


FIG. 3.



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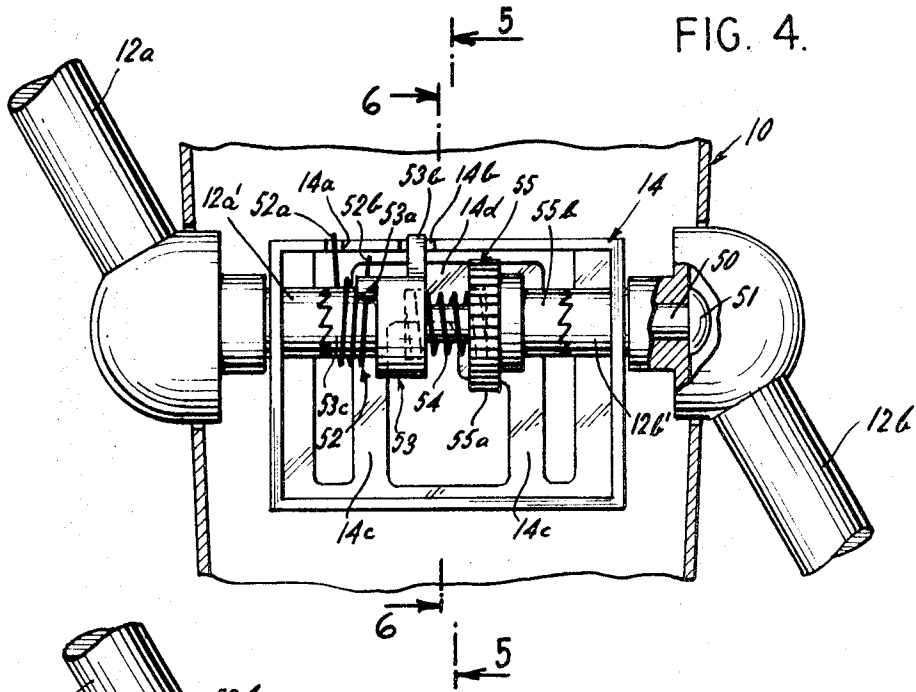


FIG. 4.

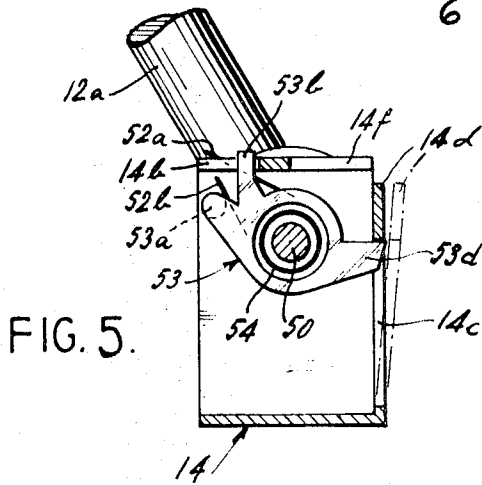


FIG. 5.

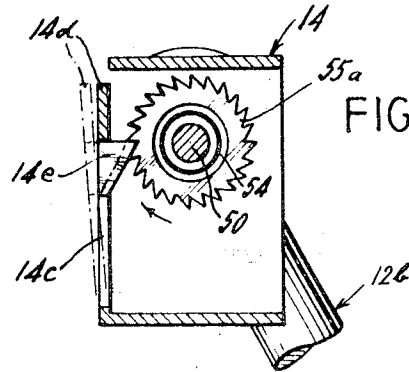


FIG. 6.

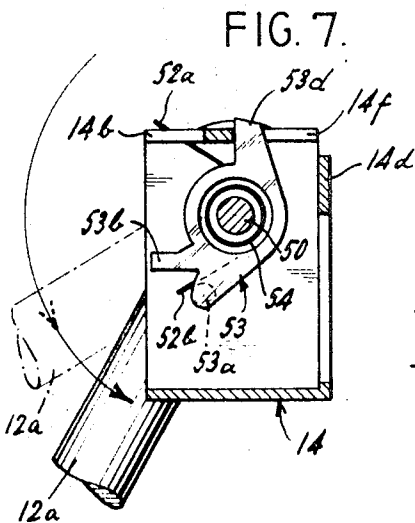


FIG. 7.

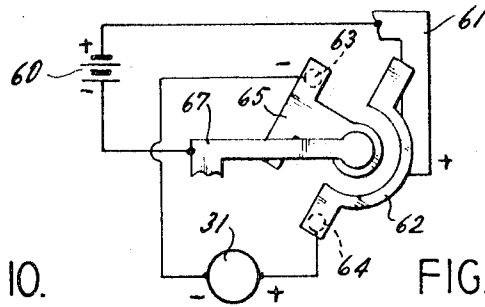
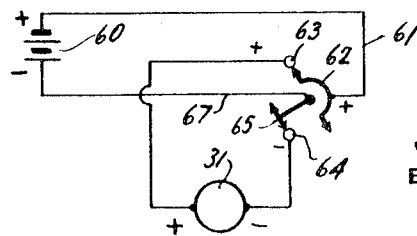


FIG. 10.

FIG. 9.



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FIG. 8.

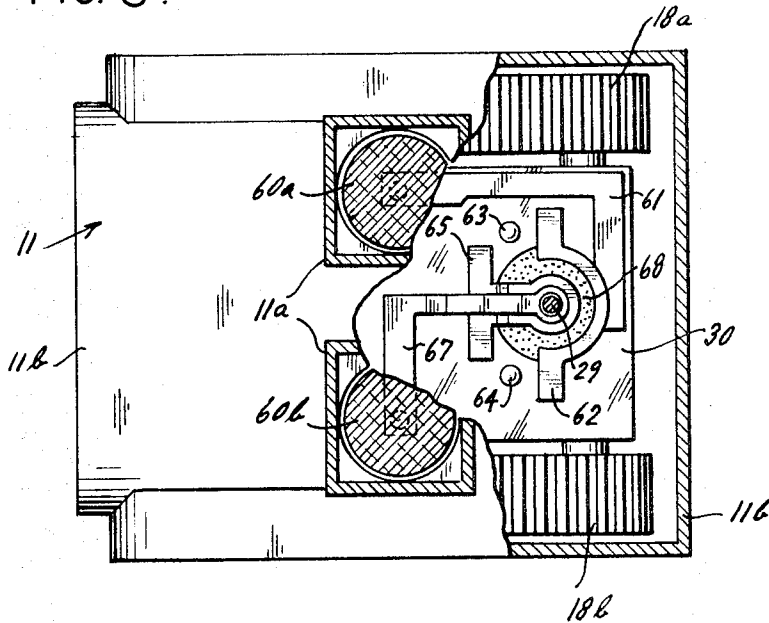


FIG. II.

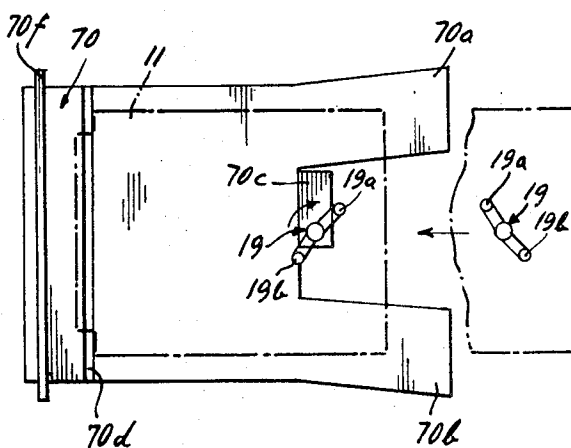
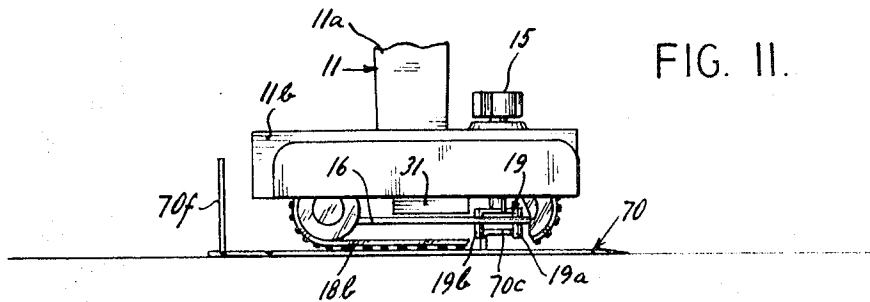


FIG. 12.

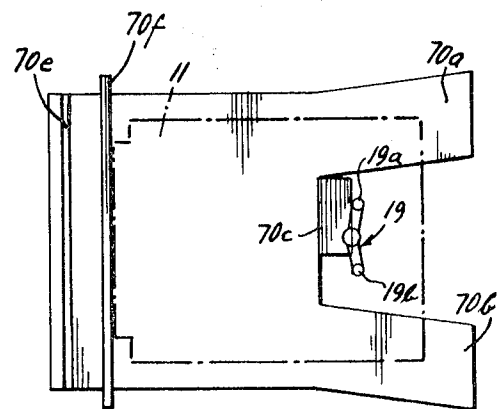


FIG. 13.

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## TOY ROBOT

This invention relates to toy robots, and more particularly to a toy robot which is capable of automatically changing its direction of movement and self-triggering arm motions.

There are prior art toy robots which have been provided with caterpillar tracks and battery-operated motors, such a robot moving in either the forward or reverse direction depending on the position of a switch. Generally, in order to control a change in direction it is necessary for the child to manually change the switch position.

It is an object of this invention to provide a toy robot with a three-position (stop, forward and reverse) switch, the position of which switch is automatically changed when the toy robot engages a switching mechanism placed in its path of movement.

Prior art toy robots, in most cases, have been provided with arms which remain in fixed positions during movement of the robot. It would be highly desirable to provide a toy robot with arms which are capable of executing a specific movement to perform some function at a predetermined point during the robot's travel.

It is another object of this invention to provide a robot with a pair of arms, one of which can be cocked to perform a specific function when the other engages an obstruction (or is moved slightly by a child).

It is still another object of this invention to provide the aforesaid arm action in an infinite number of combinations, that is, where the arm which performs the function can be cocked to move from any initial position, and the other arm which triggers the function does so when it is moved slightly from any preselected initial position.

The first of the aforesaid objects is accomplished in the illustrative embodiment of the invention by the provision of a three-position switch which is mounted for pivotal movement about a vertical axis. At the bottom of the switch, there is provided a horizontal pivotal plate with two vertical depending pins at either end thereof. The two pins are separated by approximately 180° relative to the switch axis. When the switch is first placed in the forward position, one of the two depending pins is forward of the other in the direction of the robot movement. When this pin engages a switching plate placed in the path of the robot it is pushed backward relative to the axis of the switch. This, in turn, causes the switch to rotate about its axis from the forward position toward the reverse position. Depending on the placement of a wall on the switching plate, the robot immediately starts to travel in the reverse direction or it ceases to move altogether.

The second and third objects are achieved by mounting the two arms, at their shoulders, on a common shaft extending through a supporting frame. The right arm is first rotated in the direction of a simulated karate chop until it is in the terminal position of the chop movement. The arm is then rotated approximately 90° in the reverse direction. A clutch mechanism permits free rotation of the arm in the forward direction, but the reverse movement winds up a bias spring and also cocks the arm in an initial chop position. When the cocking mechanism is released, the arm moves from the initial position to the terminal position and simulates a karate chop. The left arm is also moved to an initial desired position, typically extending forward of the robot body and slightly downward. When this arm engages an obstruction and is forced downward slightly, it releases the cocking mechanism and the bias spring forces the right arm through a simulated karate chop.

Because each arm can be set by the child in any initial position, there are an infinite number of combinations possible (the karate chop type of operation being only illustrative). The right arm can also be provided with different attachments for simulating various actions. For example, an object can be placed in the right hand of the robot so that when the cocking mechanism is released and the right arm springs forward the object will be thrown in the process.

It is a feature of my invention to provide a switch for controlling forward and reverse movement of a toy robot whose position can be changed either by hand or by engaging an obstruction placed in the path of movement of the robot to control either a reversal in its direction or its stopping.

It is another feature of my invention to provide the robot with a pair of arms, one of which can be cocked in any position to sweep through an arc when the other is moved slightly from any initial position.

Further objects, features and advantages of the invention will become apparent upon a consideration of the following detailed description in conjunction with the drawing in which:

FIG. 1 is a front view, shown partly broken away, of an illustrative toy robot constructed in accordance with the principles of the invention;

FIG. 2 is a side view, shown partly broken away, of the robot;

FIG. 3 is a bottom view of the robot with cover section 16 of FIGS. 1 and 2 removed;

FIG. 4 is a sectional view taken through body section 10 of the robot showing the mounting of arms 12a, 12b in supporting frame 14;

FIGS. 5 and 6 are sectional views taken along respective lines 5-5 and 6-6 of FIG. 4;

FIG. 7 is a view similar to FIG. 5 but shows the position of arm 12a following a movement from the cocked position shown in FIG. 5;

FIG. 8 is a sectional view taken through line 8-8 of FIG. 2;

FIG. 9 illustrates the switching elements for controlling movement of the robot in two directions;

FIG. 10 is the equivalent circuit diagram of the switching mechanism of FIG. 9;

FIGS. 11 and 12 show the cooperation of the robot switching mechanism with a plate 70 for controlling a reversal in the robot movement; and

FIG. 13 illustrates the manner in which the robot can be stopped automatically by plate 70 rather than reversing its direction.

As shown in FIG. 1, the robot includes an upper body part 10 and a lower body part 11. The upper part 10 of the robot includes a lower section 10b which can be snap-fitted onto part 11 as shown. The upper section 10a is connected to a head 13 and two arms 12a, 12b. The two arms are pivoted at their shoulders to a shaft supported in frame 14. The frame 14 can be mounted inside section 10a of the robot in any conventional manner.

Lower body part 11 is provided with two batteries 60a, 60b contained in battery compartment 11a. The positive terminal of battery 60a is connected to the negative terminal of battery 60b by a metal bridging element 69 secured inside section 10b of the robot in any conventional manner. To change the batteries, the snap-fit of sections 10 and 11 is released, new batteries are put into place, and the two sections are then snap-fitted together once again.

The bottom section includes a three-position knob 15. Two pins 19a, 19b extend through respective arcuate slots (see FIG. 3) in cover plate 16. The two pins rotate around the axis of knob 15 as the knob is moved by hand. Similarly, if the two pins are rotated relative to each other, the knob turns with them. The switch assembly is mounted in lower section 11b of the bottom half of the robot body. This section further includes two caterpillar tracks 18a, 18b.

Referring to FIG. 2, base section 11b includes a mounting plate 30 which can be secured in place in any conventional manner. At the top of the plate are various contact elements, to be described below. Knob 15 is attached to shaft 29, the shaft extending through base section 11b and plate 30 to element 19. This element bears against the underside of plate 30 to maintain knob 15, shaft 29 and element 19 in a fixed vertical position. Element 19 includes a pair of horizontal legs (see FIG. 3), one of pins 19a, 19b depending from the end of each leg. The two pins extend through arcuate slots 16a, 16b in cover plate 16. The cover plate is snap-fitted over sections such as 39a in the mounting plate in a conventional manner.

Attached to shaft 29 are two wiper contacts 62, 65. These contacts rotate in horizontal planes as shaft 29 is turned and, as will be described below, control the direction in which motor 31 operates. The motor is secured to the underside of support plate 30.

Referring to FIGS. 2 and 3, axles 28, 43 are mounted in four respective lugs 30b, 30c, 30f, 30g extending down from the underside of plate 30. At the end of each axle there is attached one of elements 17a, 17b, 17c, 17d. Each element includes small and large diameter sections, the large diameter sections having the two caterpillar tracks 18a, 18b placed around them. The drive for the tracks is provided by axle 43.

Two additional lugs 30d, 30e depend from the underside of plate 30. Shafts 41, 42 are each mounted at one end in one of these two lugs, and at the other end in lug 30c. The gear train shown in FIG. 3 serves to increase the torque on axle 43 relative to the motor torque and to decrease the speed of the axle relative to the motor speed. Gear 45, consisting of large diameter section 45a and small diameter section 45b, is mounted for free rotation on shaft 41 and engages motor gear 44. Gear 46, consisting of large diameter section 46a and small diameter section 46b, is mounted for free rotation on shaft 42. Similarly, gear 47, consisting of large diameter section 47a and small diameter section 47b, is mounted for free rotation on axle 43. Gear 48, consisting of large diameter section 48a and small diameter section 48b, is similarly mounted for free rotation on shaft 42. Finally, gear 49 is secured to axle 43. The various gears serve to successively reduce the speed of rotation of gear 49 and axle 43, as is known in the art.

The electrical switching circuit is shown symbolically in FIG. 10. Motor 31 is connected to two terminals 63, 64. The positive terminal of battery 60 is connected to contact element 62 and the negative terminal of the battery is connected to contact element 65. Both contact elements rotate around a vertical axis coincident with the axis of shaft 29 (see FIGS. 1 and 3). When the two contact elements are in the position shown in FIG. 10, contact element 65 engages terminal 64 and contact element 62 engages terminal 63. The positive potential of battery 60 is thus extended to terminal 63 and the negative potential is extended to terminal 64, and the motor turns in one direction. If the two contact elements are rotated clockwise in FIG. 10, such that contact element 62 engages terminal 64 and contact element 65 engages terminal 63 (see FIG. 9), the positive potential of battery 60 is extended to terminal 64 rather than terminal 63, and the negative potential of the battery is extended to terminal 63 rather than terminal 64. In such a case the motor rotates in the opposite direction. If the contact elements are rotated to a position intermediate the extreme positions of FIGS. 9 and 10, such that neither engages either of terminals 63, 64 as shown in FIG. 8, the motor circuit is broken and the motor does not operate. The two contact elements are attached to shaft 29 such that they rotate as described with the turning of the shaft.

FIGS. 2, 8 and 9 show the actual contact arrangement whose equivalent circuit is shown in FIG. 10. On the upper surface of plate 30, insulating disc 68 is secured to shaft 29. Attached to the disc are the two contact elements 62, 65, which elements rotate with the disc. Contact element 67 is fixed to plate 30. One end of each of contact elements 65 and 67 is provided with a hole through which shaft 29 passes. Contact element 67 is bent so that the end around shaft 29 bears against contact element 65. The other end of contact element 67 extends into one battery compartment 11a of the robot body so that it supports the negative terminal of battery 60a. Thus, the negative terminal of the battery source is extended to contact element 65 independent of its orientation as determined by the position of shaft 29.

Contact element 61 is similarly mounted to plate 30. One end of the element is extended into the other battery compartment 11a and supports the positive terminal of battery 60b. The other end of the contact element is bent up toward contact element 62 to extend the positive potential of the battery source to contact element 62 independent of its orientation relative to plate 30. Terminals 63, 64 are mounted on plate 30

for engagement with contact element 62, 65, the two terminals being connected by wires on the other side of plate 30 to the two terminals of motor 31 as depicted in FIGS. 9 and 10.

When knob 15 is rotated to the off position, the two pins 19a, 19b, extending through slots 16a, 16b in cover plate 16, are in the relative positions shown in FIG. 13 and neither of terminals 63, 64 is energized. If the child moves knob 15 to a position such that pins 19a, 19b are in the orientation shown on the right side of FIG. 12, the robot moves in the forward direction. In the path of the robot there can be placed a switching plate 70 which includes two legs 70a, 70b for supporting the caterpillar tracks (see FIG. 12). At the center of plate 70 there is an inverted L-shaped lug 70c, seen most clearly in FIGS. 11 and 12. As the robot moves to the left in FIG. 12 from an initial position shown on the right side of the drawing, pin 19a strikes the front edge of lug 70c. As the robot continues to move, the two pins rotate relative to each other inasmuch as pin 19a is prevented from further movement while switching element 19 as a whole continues to move with the robot. As the robot (shown by base section 11) moves to the left in FIG. 12 and assumes its leftmost position, switching element 19 rotates from its initial position to the position shown on the left side of the drawing. This reverses the relative potentials applied to terminal 63, 64 and the robot immediately starts to move in the reverse direction. FIG. 11 is a side view showing switching element 19 in its position just prior to the reverse movement.

In the course of switching from the forward to the reverse direction, the motor turns off. However, after the motor turns off, the momentum of the robot is sufficient to move it forward slightly. This slight forward movement causes switching element 19 to rotate sufficiently to move the contact elements from the off position to the reverse position.

Plate 70 includes two grooves 70d, 70e (see FIGS. 12 and 13) and a front wall 70f which can be snap-fitted into either groove. When the wall is in groove 70e, as shown in FIG. 12, the operation is as just described; the robot changes direction. But when the wall is in groove 70d, as shown in FIG. 13, the robot comes to a stop. The front of the robot strikes the wall just when pins 19a, 19b are rotated to the off position. The momentum of the robot cannot carry it forward relative to the plate because of the position of wall 70f. Switching element 19 does not continue to rotate to the reverse position and the robot comes to a halt.

The plate or other obstruction can be used in a similar manner to change the robot direction from reverse to forward.

The arm operation sequence is shown symbolically in FIG. 2. Right arm 12a can be moved freely in the counterclockwise direction. The child moves it to some arbitrary position as shown by the numeral 90. He then rotates the arm in the clockwise direction to the position shown by the numeral 86. In so moving the arm in the reverse direction, a spring is wound and the arm is cocked in the upper position. When the cocking mechanism is released, the arm springs forward from position 86 to position 90. As shown in FIG. 2, the robot arm simulates a karate chop along arc 88. However, any other terminal position such as 84 can be selected and when the cocking mechanism is released robot arm 12a will spring forward from position 80 along an arc 82 as shown in FIG. 2.

Left arm 12b is mounted for movement in either direction. However, clockwise rotation of the arm in FIG. 2 has no effect on the operation. A small counterclockwise rotation, on the other hand, serves to release the cocking mechanism so that arm 12a can spring forward. In operation, after arm 12a is positioned as desired by the child, arm 12b is rotated in the clockwise direction to a desired position such as that shown by the numeral 92. Thereafter, if the arm is rotated only slightly in the counterclockwise direction along arc 94 to position 96, the cocking mechanism is released and arm 12a springs forward. Any initial position for arm 12b can be selected. However, a position such as that shown by the numeral 92 is preferred because an obstruction can be placed in the path of

the robot to automatically cause the arm to rotate slightly in the counterclockwise direction as the arm hits the obstruction during forward movement of the robot.

The arm structure is shown most clearly in FIGS. 4-7. Referring to FIG. 4, the two shoulder portions of the arms are mounted for pivotal movement within body part 10 of the robot, the two arms being secured to shaft 50 as shown at 51. Arm 12b is an integral element which includes clutch member 12b' extending through a hole in frame 14. Similarly, arm 12a includes a clutch member 12a' extending through a hole in the other side of frame 14. Also mounted on shaft 50 are two additional elements 53 and 55. Element 53 includes a clutch member 53c for engaging clutch element 12a'. It also includes two lugs 53b, 53d, as shown most clearly in FIGS. 5 and 7. Also attached to element 53 is a pin 53a for engaging end 52b of spring 52. The spring is mounted on element 53 and its other end 52a is held in slot 14a of frame 14. The spring serves to bias element 53 for rotation in the counterclockwise direction in FIGS. 5 and 7.

Element 55 includes both a clutch section 55b for engaging clutch member 12b' and a toothed section 55a. Spring 54, mounted on shaft 50 between elements 53 and 55, serves to bias each of elements 53, 55 toward its respective mating clutch member 12a', 12b'.

The rear section of frame 14 includes two cutouts which form an inverted U-shaped element consisting of two vertical sections 14c and a bridging leg 14d. A lug 14e is mounted on the rightmost section 14c in FIG. 4, as shown in FIG. 6, for engaging toothed section 55a of element 55. It is apparent that element 55 cannot be rotated in the counterclockwise direction of FIG. 6 because such movement is obstructed by lug 14e. However, element 55 can move in the clockwise direction, as shown, with the inverted U-shaped element of frame 14 being bent outward slightly as shown by the dotted lines in FIG. 6.

The frame also includes two additional cutouts 14b, 14f along its upper surface as shown in FIGS. 4, 5 and 7. These cutouts permit movement of lugs 53b, 53d to the extreme positions shown in FIGS. 5 and 7. Lug 53d also moves within the central cutout defined by sections 14c for engagement with section 14d of the frame as shown in FIG. 5.

In operation, arm 12a is first moved in the counterclockwise direction of FIG. 2 to a desired terminal position 90. Referring to FIG. 4, it is seen that such a movement permits clutch members 12a', 53c to move relative to each other. As arm 12a is rotated, element 53 is forced to the right in FIG. 4 against the restraining force of spring 54. After the arm is rotated to the desired terminal position, spring 54 forces element 53 to move to the left to the position shown in FIG. 4 where the two clutch elements are engaged. Thereafter, arm 12a is rotated in the clockwise direction of FIG. 2. Because the two clutch elements are engaged, element 53 rotates on shaft 50 together with arm 12a. Initially, lug 53d is in the position shown in FIG. 7. As element 53 is rotated in the clockwise direction, the lug bears against frame section 14d and forces it outward as shown by the dotted lines in FIG. 5. After the lug has cleared section 14d of the frame, this section of the frame springs back into place as shown in FIG. 5. As element 53 is moved in the clockwise direction from the position shown in FIG. 7 to the position shown in FIG. 5, the two ends of spring 52 are forced toward each other. The spring is thus wound and is cocked to move arm 12a from the position shown in FIG. 5 to that shown in FIG. 7. However, such a movement is prevented as long as section 14d of the frame prevents rotation of element 53. Lug 53b is provided in order to prevent excessive movement of arm 12a in the clockwise direction during the cocking operation. After the arm has been rotated clockwise to an extent shown by arc 88 in FIG. 2, lug 53b bears against the upper part of the frame to prevent further rotation.

Arm 12b is then moved in the clockwise direction of FIG. 2. The same motion is in the counterclockwise direction in FIG. 6 since the view is taken from the right side of the robot. When arm 12b is rotated in this direction, clutch elements 55b, 12b'

slip relative to each other. As the rotation of the arm continues element 55 is forced to the left in FIG. 4 against the bias force of spring 54. When the child stops moving arm 12b, the spring forces element 55 to the right so that the clutch is engaged once again. During this clockwise movement (FIG. 2), it should be noted that element 55 does not rotate about shaft 50. Teeth 55a and lug 14e serve as a one-way clutch which permits rotation of element 55 only in the clockwise direction of FIG. 6.

After arm 12b is positioned, such as shown by the numeral 92 in FIG. 2, the robot is set into motion. As the robot continues to move in the forward direction, if arm 12b is forced downward slightly, for example, by engagement with an obstruction placed in the path of movement of the robot, element 55 rotates slightly with the arm due to the fact that with a counterclockwise rotation of arm 12b in FIG. 2, the clutch comprising elements 55b and 12b' is engaged. The same movement is in the clockwise direction of FIG. 6, and inasmuch as element 55 moves with arm 12b it is apparent that teeth 55a force lug 14e and section 14d of the frame outward. This, in turn, allows lug 53d in FIG. 5 to clear section 14d and spring 52 forces arm 12a to rotate in the counterclockwise direction of FIGS. 2, 5 and 7. The rotation is limited by the engagement of lug 53d with the top part of the frame as shown in FIG. 7. During the movement, right arm 12a simulates a karate chop or can perform some other function, e.g., the throwing of an object originally placed in the arm.

Although the invention has been described with reference to a particular embodiment, it is to be understood that this embodiment is merely illustrative of the application of the principles of the invention. Numerous modifications may be made therein and other arrangements may be devised without departing from the spirit and scope of the invention.

I claim:

1. A toy robot comprising a body, means mounted at the bottom of said body for moving the toy robot, a battery-operated motor for operating said moving means in either direction, and a switching circuit for energizing said motor to rotate in either direction, said switching circuit including contact support means mounted in said body for pivotal movement about a central axis, contact means attached to said support means and operative to energize said motor in either direction in accordance with the rotational position of said support means about said central axis, and depending means attached to said support means at the bottom thereof along at least one axis other than said central axis and responsive to engagement with an obstruction while the toy robot moves for rotating said support means about said central axis to change the movement of the toy robot.

2. A toy robot in accordance with claim 1 wherein said support and contact means have three operative positions, the first for energizing said motor in a first direction to move the toy robot in a forward direction, the second to deenergize the motor, and the third for energizing said motor in the second direction to move the robot in the reverse direction.

3. A toy robot in accordance with claim 2 further including means for limiting the pivotal movement of said support means about said central axis to a predetermined arc, and wherein said second operative position of said support and contact means is intermediate said first and third positions along said arc.

4. A toy robot in accordance with claim 2 further including a knob attached to said support means along said central axis for enabling a child to rotate manually said support means for changing the movement of the toy robot.

5. A toy robot in accordance with claim 4 wherein said depending means includes first and second pins mounted to the underside of said support means on opposite sides of said central axis.

6. A toy robot in accordance with claim 5 wherein said contact means are arranged such that when said first pin is forward of said second pin in the direction of forward movement the obstruction of the movement of said first pin is operative

to cause said second pin to move forward of said first pin and said support means to rotate about said central axis in the direction for reversing the robot movement.

7. A toy robot in accordance with claim 1 wherein said depending means includes two pins mounted to the underside of said support means on opposite sides of said central axis.

8. A toy robot in accordance with claim 7 wherein said contact means are arranged such that when first pin is forward of said second pin in the direction of forward movement the obstruction of the movement of said first pin is operative to cause said second pin to move forward of said first pin and said support means to rotate about said central axis in the direction for reversing the robot movement.

9. A toy robot in accordance with claim 2 wherein the momentum of the toy robot during movement is sufficient when said support and contact means are moved from one of said first and third positions to said second position upon engagement of said depending means with an obstruction to allow the toy robot to continue to move sufficiently such that said support and contact means continue to move from said second position to the other of said first and third positions.

10. A toy robot in accordance with claim 9 further including a plate for placement in the path of movement of the toy robot, said plate having an obstruction thereon and a wall for preventing movement of the toy robot relative to the plate as a result of the momentum of the toy robot when said support and contact means are moved to said second position upon engagement of said depending means with said obstruction.

11. A toy robot in accordance with claim 10 wherein said wall is removable from said plate for allowing the momentum of the toy robot to cause the robot to continue to move even when said support and contact means are moved to said second position to effect movement of said support and contact means to said other of said first and second positions.

12. A toy robot in accordance with claim 2 wherein said contact means includes first and second motor terminals, a first contact element mounted on said support means, a second contact element mounted on said support means, each of said first and second contact elements being arranged for engagement with either of said first and second motor terminals depending on the rotational position of said support means. A first fixed contact mounted in said body having a first end for connection to a positive source of potential and a second end for slideable engagement with said first contact element, and a second fixed contact mounted in said body having a first end for engagement with a negative source of potential and a second end for slideable engagement with said second contact element.

13. A toy robot in accordance with claim 12 wherein said body includes upper and lower parts, said lower part including a battery compartment and said upper part including a contact for bridging a pair of batteries inserted in said battery compartment when said upper part is attached to said lower part.

14. A toy robot in accordance with claim 12 wherein the momentum of the toy robot during movement is sufficient when said support and contact means are moved from one of said first and third positions to said second position upon engagement of said depending means with an obstruction to allow the toy robot to continue to move sufficiently such that said support and contact means move from said second position to the other of said first and third positions.

15. A toy robot in accordance with claim 1 wherein said contact means includes first and second motor terminals, a first contact element mounted on said support means and connectable to a positive source of potential, and a second contact element mounted on said support means and connectable to a negative source of potential, each of said first and second contact elements being selectively engageable with either of said first and second motor terminals depending on the rotational position of said support means about said central axis.

16. A toy robot comprising a body, means mounted at the bottom of said body for moving the toy robot, a battery-operated motor for operating said moving means in either

direction, and a switching circuit for energizing said motor to rotate in either direction, said switching circuit including contact means mounted in said body for rotational movement and operative to energize said motor in either direction in accordance with its rotational position, and means depending from the bottom of said body and responsive to engagement with an obstruction while the toy robot moves for rotating said contact means to change the movement of the toy robot.

17. A toy robot in accordance with claim 16 wherein said contact means has three operative positions, the first for energizing said motor in a first direction to move the toy robot in a forward direction, the second to deenergize the motor, and the third for energizing said motor in the second direction to move the robot in the reverse direction.

18. A toy robot in accordance with claim 16 further including a knob attached to said contact means enabling a child to rotate manually said contact means for changing the movement of the toy robot.

19. A toy robot in accordance with claim 17 wherein said depending means includes first and second pins arranged such that when said first pin is forward of said second pin in the direction of forward movement the obstruction of the movement of said first pin is operative to cause said second pin to move forward of said first pin and said contact means to rotate in the direction for reversing the robot movement.

20. A toy robot in accordance with claim 16 wherein said depending means includes first and second pins arranged such that when said first pin is forward of said second pin in the direction of forward movement the obstruction of the movement of said first pin is operative to cause said second pin to move forward of said first pin and said contact means to rotate in the direction for reversing the robot movement.

21. A toy robot in accordance with claim 17 wherein the momentum of the toy robot during movement is sufficient when said contact means are moved from one of said first and third positions to said second position upon engagement of said depending means with an obstruction to allow the toy robot to continue to move sufficiently such that said contact means continues to move from said second position to the other of said first and third positions.

22. A toy robot in accordance with claim 21 further including a plate for placement in the path of movement of the toy robot, said plate having an obstruction thereon and a wall for preventing movement of the toy robot relative to the plate as a result of the momentum of the toy robot when said contact means is moved to said second position upon engagement of said depending means with said obstruction.

23. A toy robot in accordance with claim 22 wherein said wall is removable from said plate for allowing the momentum of the toy robot to cause the robot to continue to move even when said contact means is moved to said second position to effect movement of said contact means to said other of said first and second positions.

24. A toy robot in accordance with claim 16 wherein said contact means includes first and second motor terminals, support means, a first contact element mounted on said support means, a second contact element mounted on said support means, each of said first and second contact elements being arranged for engagement with either of said first and second motor terminals depending on the rotational position of said support means, a first fixed contact mounted in said body having a first end for connection to a positive source of potential and a second end for slideable engagement with said first contact element, and a second fixed contact mounted in said body having a first end for engagement with a negative source of potential and a second end for slideable engagement with said second contact element.

25. A toy robot in accordance with claim 24 wherein said body includes upper and lower parts, said lower part including a battery compartment and said upper part including a contact for bridging a pair of batteries inserted in said battery compartment when said upper part is attached to said lower part.