Sept. 3, 1957 C. W. OLSON 2,804,720

MECHANICAL TOY FIGURE

Filed Sept. 20, 1954 2 Sheets-Sheet 1

Fig. 1

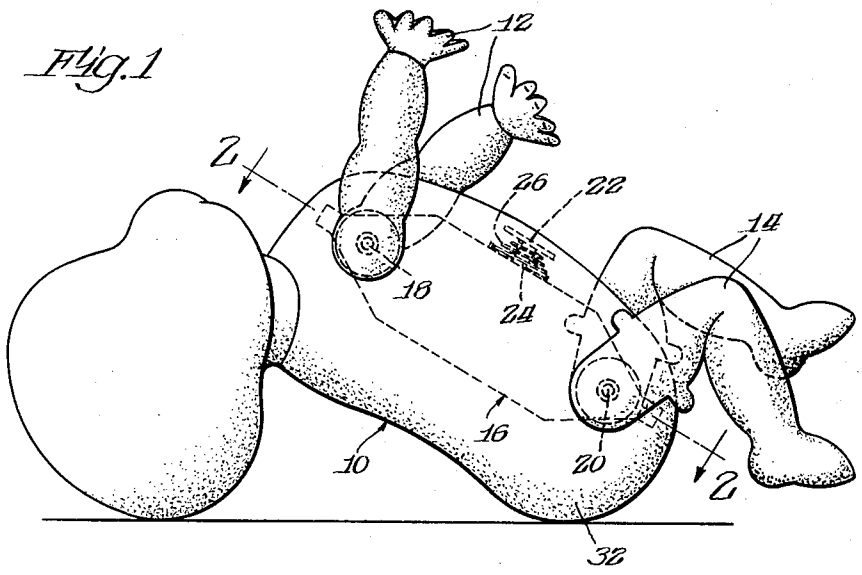
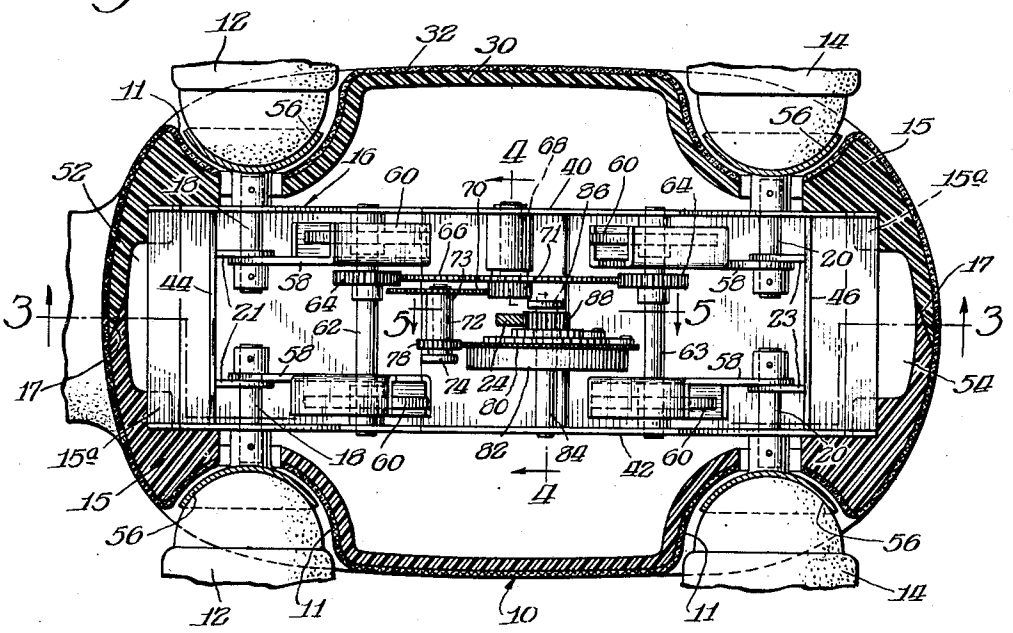


Fig. 2



Inventor:
Clare W. Olson,
By Bair, Freeman & Molinare
Attys.

Sept. 3, 1957 C. W. OLSON 2,804,720

MECHANICAL TOY FIGURE

Filed Sept. 20, 1954 2 Sheets-Sheet 2

Fig. 3

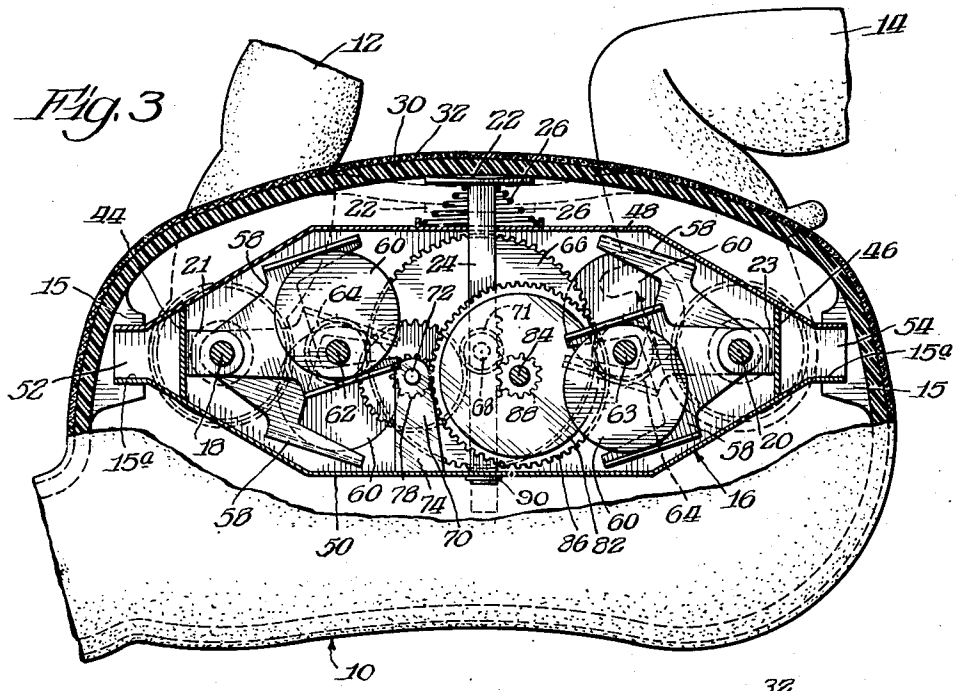


Fig. 4

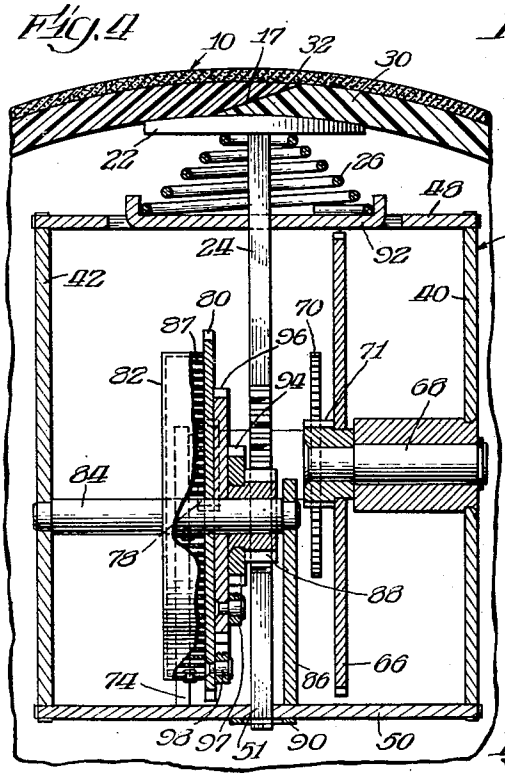
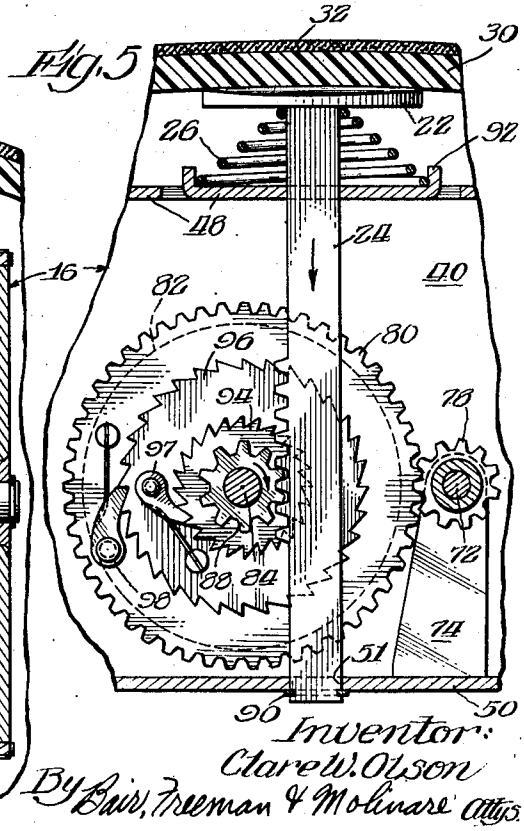


Fig. 5



Inventor:
Clare W. Olson
By Bair, Freeman & Molinare Attys.

United States Patent Office 2,804,720 Patented Sept. 3, 1957

2,804,720

MECHANICAL TOY FIGURE

Clare W. Olson, Wheaton, Ill.

Application September 20, 1954, Serial No. 456,913

2 Claims. (Cl. 46—120)

This invention relates to a mechanical toy figure and more particularly to an animated doll having a clockwork motor associated with the limbs thereof. Toy figures of this type have been known for years, but so far as I am aware, the clockwork motor employed in these figures was wound by turning a key projecting from the body of the figure. Such devices have been found to be difficult for very small children to operate. Furthermore, projecting stems and keys may cause injury to a small child who is likely to fall on the doll or in some other way strike the projection.

It is the primary object of my invention to provide a toy figure having the winding means completely confined within the body thereof.

It is a further object to provide a concealed reciprocative winding mechanism which tightens the clockworks spring merely by squeezing the flexible body of the toy figure adjacent said winding means.

It is a further object to provide a doll of the type indicated which has a smooth, soft, resilient body.

These and other objects will become apparent from the following description when read in conjunction with the accompanying drawings, in which:

Figure 1 is a side view of a baby doll which illustrates the invention;

Figure 2 is a longitudinal section taken along the line 2—2 showing the internal works of the motor and the method of connecting the motor to the limbs of the doll;

Figure 3 is a sectional view taken along the line 3—3 of Figure 2;

Figure 4 is an enlarged sectional view taken along the line 4—4 of Figure 2; and

Figure 5 is an enlarged fragmentary section taken along the line 5—5 of Figure 2.

The doll illustrated in its entirety in Figure 1 has a head, a body **10**, and arms **12**, and legs **14**, which are fixed to the end of shafts **18** and **20**, respectively, comprising part of the mechanical means for oscillating the limbs. The novel winding means consists of a button **22** adjacent the inner wall of the body **10** fixed to the end of a reciprocating shaft or rack **24**, which cooperates with a pinion on the winding shaft. The motor **16** may be wound merely by depressing the abdomen of the doll and the underlying button **22** against the force of the spring **26**, releasing it, and repeating the operation until the motor spring is completely wound. The motor may be designed so that the winding button **22** is located at any convenient place within the figure.

The body **10** and limbs **12**, **14** preferably are made from a suitable soft, yielding material **30**, capable of retaining its shape. Molded rubber or a molded rubber-like plastic, such as plasticized polyvinyl chloride, will serve very well for this purpose. A harder material, such as papier-mache, may be used except in the area adjacent the winding button **22**, where, of course, the body must be resilient. The body may be molded or otherwise shaped in two longitudinal halves which are later assembled by adhering them together along the

skived splice **17** with a suitable adhesive after the works has been inserted. The splice is best shown in Figure 2. Suitable sockets are provided in the body for receiving the ball-like ends of the limbs **12** and **14**. The upper and lower ends of the body have bosses **15** on the inner surface thereof which contain recesses **15***a* in which the motor is mounted. Bosses **15** are preferably molded integrally with the body halves. The body wall may be externally coated with a suitable material **32**, such as rubber latex, which may be colored if desired to provide a smooth skin having a life-like appearance.

The clockworks motor **16** is of conventional construction and need not be described in great detail for an understanding of the invention. It comprises longitudinal side plates or frame members **40**, **42** spaced by cross members **44**, **46**, which constitute a rigid structure for carrying the moving parts of the motor. As best shown in Figure 3, top and bottom panel members **48** and **50** cover the frame to enclose the works, the panels joining each other in horizontal projections **52** and **54**, which are adapted to fit snugly into recesses **15***a* for supporting the motor within the body **10**. The two front shafts **18** for the arms **12** and rear shafts **20** for the legs **14** are journalled in the side plates **40**, **42** and in brackets **21**, **23** spaced inwardly from the side plates and fixed to the cross members **44** and **46**. Fastened securely to the outer end of each shaft is an arcuate shell **56**, approximately hemispherical in shape, adapted to receive the ball-like ends of the limbs **12** and **14**. All four shells are of identical construction. The limbs may be secured to the shells in any suitable manner, as for example by means of an adhesive, or mechanically by means of rivets or the like.

To oscillate the shafts **18** and **20** and thus move the limbs, yokes **58** are secured to the inner ends of the shafts **18** and **20**. The yokes, best shown in Figure 3, fit over circular discs **60** eccentrically mounted on shafts **62**, **63** journalled in frame members **40**, **42**. As the eccentrically mounted discs revolve, the yokes **58** are caused to oscillate up and down, thus moving the shafts **18** and **20** to which the limbs are secured. The extremities of oscillation of the yokes **58** and the discs **60** may be seen by comparing the relative positions of yokes for the arm and leg nearest the observer in Figure 3, with those for the limbs in the rear. It will be noted that the rotation of the two front shafts **18** is 180° out of phase, and likewise the rotation of the rear shafts **20** is 180° out of phase so that the arms and legs do not move in the same direction simultaneously. By changing the size and eccentricity of the discs, the angle through which the limbs oscillate may be adjusted.

The shafts **62** and **63** are driven through gears **64** fixed thereto which mesh with a common gear **66** mounted on a stub shaft **68** secured to the frame member **40** and driven by the clockworks through a gear train. The clockwork mechanism for driving the gear **66** comprises a gear **70** fixed to one end of a shaft **72** journalled in upright **74** secured to the bottom of the main frame. The gear **70** meshes with a pinion **71** fixed to the end of shaft **68** outside the gear **66**. The pinion **78**, fixed to the shaft **72** and spaced therefrom by sleeve **73**, meshes with the main driving gear **80** mounted on shaft **84**, which is journalled in the frame **42** and upright **86** secured to the bottom of the frame. Gear **80** is fixed to the barrel **82** housing a clock spring **81**, as best shown in Figure 4, the inner end of which is attached to shaft **84** and the outer end of which is attached to the barrel.

To wind the spring by rotating the shaft **84**, I have provided a pawl and ratchet arrangement cooperating with reciprocating rack or shaft **24** and pinion **88**, as best shown in Figures 4 and 5. The shaft or rack **24** is journalled in top and bottom frame members **48** and **50** and

terminates in a button **22**, as previously indicated. A coil spring **26** encircles the shaft beneath the button and rests on panel member **48** within the punched-out ears **92**. The spring bears against the underside of button **22** and normally biases the shaft **24** upwardly. A ring **90**, secured in grooves in the lower end of the shaft, prevents the shaft from moving upwardly through the opening **51** in the lower frame member **50**.

A ratchet wheel **94**, rotatably mounted on shaft **84**, is fixed to the pinion **88** so that it will rotate in either direction in accordance with the vertical movement of the rack **24**, which meshes with the pinion **88**. The spring-biased pawl **97** is mounted on a second ratchet wheel **96** fixed to shaft **84**. Consequently, when the rack **24** is moved vertically downward, in the direction of the arrow, the pinion **88** and the ratchet wheels **94** and **96** rotate together in a clockwise direction, the wheel **96** turning the shaft **84**, thus winding the spring **81** fastened thereto. A second spring-biased pawl **98**, mounted on the main gear **80**, cooperates with ratchet wheel **96** and permits the shaft **84** to rotate in a counterclockwise direction only when the main gear is rotating, thus driving the entire gear train as the spring unwinds. When the pressure on the rack is released, spring **26** returns the rack to its normally elevated position, causing the pinion **88** and ratchet **94** to rotate on shaft **84** in a counterclockwise direction.

A suitable speed limiting governor of any suitable construction or an escapement (not shown) may be provided if required to prevent the spring from unwinding too rapidly.

The operation of the various parts has already been described, and it will be obvious that by application of pressure to the soft, yielding abdomen of the doll the spring motor can be wound up to cause oscillation of the limbs closely resembling a live human baby. The position of the abdomen when the rack is depressed is shown in dotted lines in Figure 3.

It will be obvious that any tiny child is capable of operating this toy without any danger whatsoever to himself. All mechanical parts are completely confined within the body, which is soft and smooth externally and serves to pad the button **22**.

It will be apparent that the invention may be utilized in all sorts of toys and is not limited to dolls. For example, the invention may be incorporated in toy animals which are designed to walk, and which are powered by a clockwork motor of the type described. The invention may also be utilized in toy vehicles by providing a flexible area, as for example in the bottom thereof, disposed

adjacent the end of the reciprocative winding means for the motor. It will be apparent, also, that the motor need not be constructed in the manner illustrated but may be of any suitable construction, provided, however, it is adapted to be wound by a reciprocating shaft which has an outer end in contact with or adjacent to a flexible bellows or resilient surface which is easily depressible. If desired, a bellows type voice box may be associated with the winding means to create sounds appropriate to the particular toy in which the motor is mounted. Other variations in the construction of the toy and the motor will be obvious to those skilled in the art without departing from the spirit and scope of the invention as defined in the appended claims.

What I claim as new and desire to secure by Letters Patent of the United States is:

1. In a toy figure of the class described, in combination, a flexible elongated body, a rigid frame axially disposed within said body and spaced from the sides thereof, limbs articulated to said body by means of shafts rotatably mounted on said frame and extending through the body wall, arms fixed to the portion of said shafts disposed within the body defining means for oscillating said shafts and the limbs connected thereto, a spring motor of the clockworks type mounted in said frame for actuating said arms, a spring-biased reciprocative winding shaft for winding said spring motor mounted on said frame transversely of the body and completely concealed therein, said winding shaft having one end normally adjacent the body wall and being operative to move inwardly upon application of force to the portion of the body adjacent said end and to return to normal position upon release of said force, thereby winding said motor without any externally-projecting winding means to cause oscillation of said limbs.

2. The toy figure of claim 1 in which said one end of the winding shaft has a button fixed thereto for increasing the contact area with said flexible body and said body is made from elastic material.

References Cited in the file of this patent

UNITED STATES PATENTS

659,866	Cytron	Oct. 16, 1900
1,978,337	Bowers	Oct. 23, 1934
2,148,010	Bowers	Feb. 21, 1939
2,288,371	Rothschild	June 30, 1942
2,629,967	Lohr et al.	Mar. 3, 1953
2,741,870	Lang	Apr. 17, 1956