Feb. 28, 1928. 1,661,093

G. D. ROGERS

DOLL

Filed Nov. 11, 1926 2 Sheets-Sheet 1

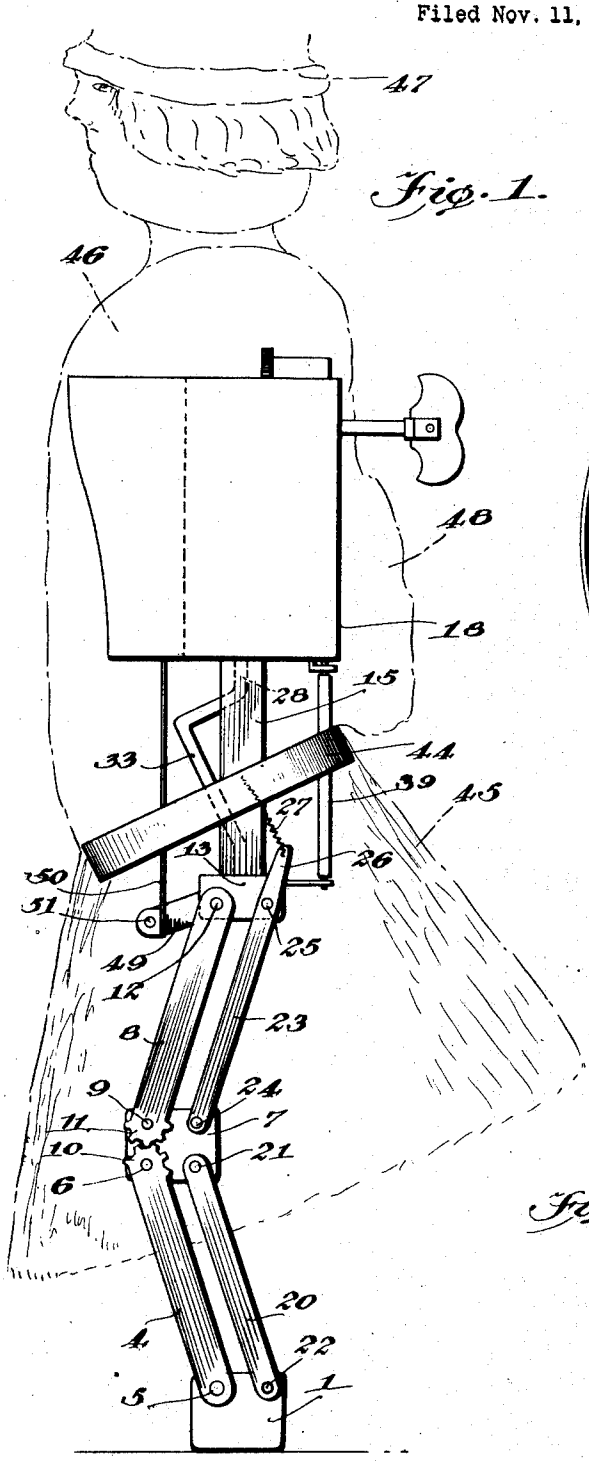


Fig. 1.

Fig. 4.

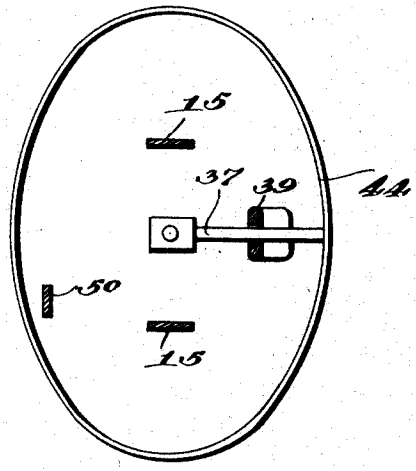
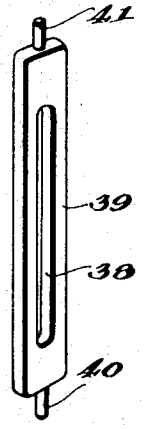


Fig. 5.



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Fig. 2.

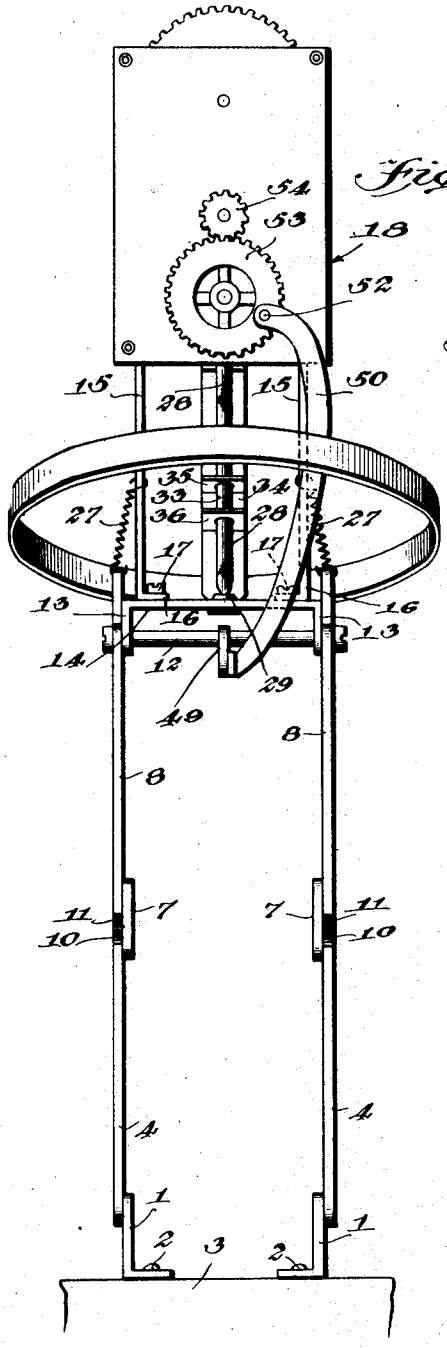
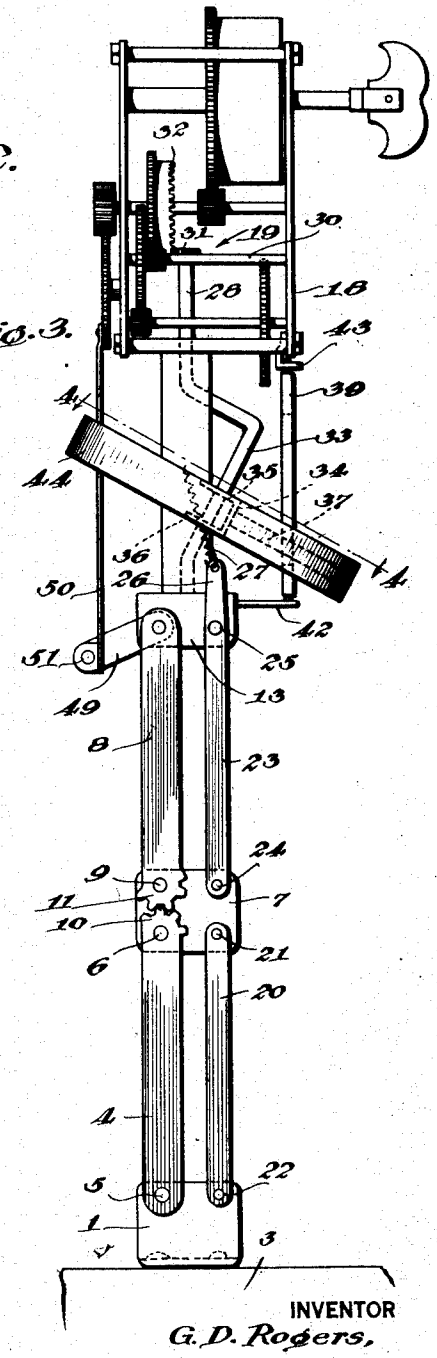


Fig. 3.



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UNITED STATES PATENT OFFICE.

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DOLL.

Application filed November 11, 1926. Serial No. 147,800.

My invention relates to improvements in dolls, which are moved mechanically in a manner to simulate dancing, and consists in the combinations, constructions and arrangements herein described and claimed.

An object of the invention is the provision of a mechanical doll which is adapted to move in a manner which closely simulates the movements of a hula dancer.

A more specific object of the invention is the provision of a mechanical doll which is adapted to bend at the knees and to simultaneously swing horizontally in a circle and sway or oscillate vertically substantially at the waist line, thus producing rythmic movements which closely resemble the body movements of an actual hula dancer.

A further object of the invention is the provision in a doll of the character described of a novel motion transmitting mechanism for making use of the power of a suitable prime mover to effect movement of parts of the doll to simulate movements of the hula dance.

Other objects and advantages of the invention will be apparent from the following description, considered in conjunction with the accompanying drawings, in which:—

Figure 1 is a side elevation of the improved doll mechanism with the clothing and non-essential members shown more or less diagrammatically in dot and dash lines,

Figure 2 is a view of the supporting and operating structure of the device,

Figure 3 is a side view of the structure of the device as shown in Figure 2.

Figure 4 is a section substantially along the line 4—4 of Figure 3, and

Figure 5 is a perspective view of a pivoted guide bar that is used in the operating mechanism of the device.

The supporting structure of the device may comprise a pair of feet 1 which are secured firmly at 2 to a base 3. A pair of legs are provided and each comprises a lower section 4 which is connected at its lower end by a horizontal pivot element 5 with the corresponding foot 1. The upper end of each lower section 4 is connected pivotally by horizontal pivot elements 6 with a connector plate 7 that is disposed vertically edgewise. Each leg also includes an upper section 8 having its lower end portion connected by a horizontal pivot element 9 with the corresponding connector plate 7 above the upper end of the corresponding lower leg section 4. The lower and upper sections of each leg may have their adjacent ends formed to produce gears 10 and 11 respectively, the teeth of which are in mesh with each other.

The upper end portions of the upper sections 8 of the legs are rigidly secured to the opposite end portions of transverse rock shaft 12 which is journaled in transversely aligned openings in depending hanger arms 13 at the opposite ends of a transverse cross bar 14.

The body of the supporting structure of the device includes a pair of upright side bars 15 having inturned attaching members 16 at their lower ends secured firmly at 17 on the end portions of the cross bar 14. The body side bars 15 carry an upper body frame 18 which may be the casing of a clockwork mechanism generally indicated at 19.

The supporting structure of the device also may include a pair of lower links 20 having their upper ends pivotally connected as at 21 to the connector plates 7 and having their lower ends pivotally connected as at 22, to the feet 1, each of the links 20 being parallel at all times with the associated lower leg section 4. A pair of upper links 23 respectively are parallel with the associated upper leg sections 8 and have their lower ends pivotally connected as at 24, with the connector plates 7 above the upper ends of the lower links 20. The links 23 are connected pivotally as at 25, to the hanger members 13 at the ends of the cross bar 14 and the upper extremities 26 of the links 23 extend above the level of the cross bar 14 and are connected by retractile springs 27 with the body side bars 15. The retractile springs 27 tend to maintain the legs of the device upright as shown in Figs. 2 and 3 and prevent accidental bending of the legs at the joints between the upper and lower sections of the legs because of the weight of the cross bar 14 and the parts of the device which are carried or superimposed on the cross bar.

The actuating mechanism of the device may include the aforesaid clock work mechanism 19 and a driven shaft 28 which is

pivotally supported at its lower end by a bearing 29 on the cross bar 14 intermediate the body side bars 15, the upper end portion of the shaft 28 being journaled in a suitable supporting member, as at 30, within the casing of the clock work mechanism so that the shaft 28 is mounted to turn about a vertical axis and so that a gear 31 on the extreme upper end portion of the shaft 28 will receive motion from a slowly turning gear 32 that is included in the clock work mechanism. The shaft 28 may be termed a crank shaft since it includes a portion 33 which extends obliquely to the axis of rotation of the shaft 28. A yoke has a head or web portion 34 and a pair of arms 35 and 36, respectively, which are vertically spaced and are pivotally supported on the inclined crank portion 33 of the shaft 28. A guide pin 37 is rigid at its inner end with the middle portion of the yoke head or web and extends slidably through a vertical slot 38 in a vertical guide bar 39. The guide bar 39 may have vertically alined pivot elements 40 and 41, respectively, which are journaled in rearwardly extending arms of brackets 42 and 43. The brackets 42 and 43 are carried by the cross bar 14 and the rear portion of the upper body frame or casing 18, respectively. The pin or rod 37 supports a ring or hoop 44 which may be elliptical in configuration and which is located in encircling relation to the body side bars 15 and the guide rods 39, the rod 37 being rigidly secured at its outer end to the inner face of the ring 44 intermediate the length of the back portion of the ring 44 and so that the major axis of the ring 44 extends transversely of the body of the device. The ring 44 defines the waist portion of the doll and a skirt 45 may be suspended from the ring 44 as shown in Fig. 1.

The casing 18 of the clock work mechanism may have any suitable form-producing matter secured thereon as indicated at 46 to fill out the upper portion of the body of the device as required to closely resemble the body of a doll and such filler matter may cary a head 47 and it is obvious that arms may also be provided on the upper portion of the body of the device if desired and secured thereto in any suitable manner, no arms being shown in the drawings. A waist or upper body garment 48 may be used to cover the body of the device, such garment being secured in any suitable known manner to the body of the device and attached at its lower end to the ring 44.

The rock shaft 12 carries a rocker arm 49 which is inclined downwardly and forwardly from the rock shaft when the legs of the device are erect as shown in Figs. 2 and 3. A curved connecting rod 50 is pivotally connected at its lower end at 51 with the outer end of the rocker arm 49 and extends through the ring 44 at the front of the body of the device to a crank pin 52 which is carried by a gear 53 that is rotatably supported by the casing 18 at the front of the latter. Motion is transmitted to the gear 53 from the clock work mechanism 19 through the ball gear 54. Since the upper end of the connecting rod 50 is pivotally attached to the crank pin 52 it will be manifest that rotation of the gear 53 will cause reciprocation of the connecting rod 50 so that the legs of the device will bend at the joints between the upper and lower sections thereof as the gear 53 rotates and a complete rotation of the gear 53 will cause the device to move from an erect position to a squatting position and then to again return to the erect or upright position. From the foregoing description of the various parts of the device, the operation thereof may be readily understood. The ring 44 will lie in a plane that is inclined to the horizontal when the axis of rotation of the shaft 28 is vertical as shown in the drawings and the ring supporting crank portion 33 of the shaft 28 is oblique to the vertical as shown. When the clock work mechanism is actuated, the shaft 28 will be turned about its axis of rotation at a relatively slow speed and the ring 44 will be swung bodily in a circle about the axis of rotation of the shaft 28, being guided in its bodily movement about the axis of rotation of the shaft 28 by the supporting pin or rod 37 and the guide bar 39. The guide bar 39 may be mounted to turn about the axial lines of the journal pin portions 40 and 41 thereof sufficiently to permit a smooth turning or swinging movement of the ring 44 about the axis of the shaft 28, as shown, or it is obvious that the guide bar 39 may be made rigid with the bracket arms 42 and 43 and the guide slot 38 made sufficiently wide to permit the supporting pin 37 to swing laterally far enough to permit the required swinging movement of the ring 44 about the axis of the shaft 28. As the ring 44 swings bodily in a circle about the axis of rotation of the shaft 28 it also sways or oscillates vertically about an axis which will be shifted about the axis of rotation of the shaft 28 as the crank portion 33 of the shaft 28 swings about the axis of rotation of the shaft 28. At the same time, the body portion of the device, including the ring 44, will be shifted vertically by reason of the bending of the legs of the device at the joints between the upper and lower sections of the legs. The driving connections between the clock work mechanism and the connecting rod 50 for bending the legs of the device to reciprocate the body of the device vertically and between the clock work mechanism and the shaft 28 for rotating the shaft 28 to swing the ring 44 bodily in a circle substantially about a vertical axis and to simultaneously oscillate the ring 44 about

a constantly varying axis that is oblique to the vertical may be relatively arranged so that the ring 44 may be moved any desired number of times, within limits, about the axis of rotation of the shaft 28 during each complete cycle of bending movements of the legs of the device. The effect of the movements which have just been described of the legs and the body portion of the device is to cause simulation by the device of all the movements of an actual hula dancer during the performance of the so-called hula dance in an extremely realistic manner, the body of the device appearing to swing and sway or oscillate at the hips and to simultaneously move downward and upward as the legs of the device bend in the manner of the actual hula dancer.

Obviously the invention is susceptible of embodiments in forms other than that which is illustrated in the accompanying drawings and I therefore consider as my own all such modifications and adaptations thereof as fairly fall within the scope of the appended claims.

I claim:—

1. In a device adapted to be inserted in the body of a doll, a rotatable shaft having a member extending obliquely to the axis of rotation of the shaft, a guide member spaced from said shaft and extending parallel to the axis of rotation of said shaft, a motion transmitting member pivotally connected with said obliquely extending member and engaged with said guide member, and a ring carried by said motion transmitting member, and providing means for supporting a skirt for the doll, the axis of said ring being parallel to the oblique member of said shaft, the structure so assembled being adapted to impart a rhythmical motion to the device.

2. In a device adapted to be inserted in the body of a doll, a rotatable shaft having a member extending obliquely to the axis of rotation of the shaft, a guide member spaced from said shaft and extending parallel to the axis of rotation of said shaft, a motion transmitting member pivotally connected with said obliquely extending member and engaged with said guide member, a ring carried by said motion transmitting member and providing means for supporting a skirt for the doll, the axis of said ring being parallel to the oblique member of said shaft, and means for supporting said shaft for rotation about a vertical axis, the structure so assembled being adapted to impart a rythmical motion to the device.

3. In a mechanical doll, a body frame structure a shaft supported by said body frame structure for rotation about an axis extending longitudinally of said body, said shaft having a portion extending obliquely to the axis of rotation of the shaft, a ring encircling said body frame structure, motion transmitting means connecting said ring with said oblique portion of said shaft, and guide means co-operating with said motion transmitting means to prevent said ring from rotating about a given axis and to permit said ring to swing bodily about the axis of rotation of the shaft and to simultaneously oscillate in another direction.

4. In a mechanical doll, a body frame structure a shaft supported by said body frame structure for rotation about an axis extending longitudinally of said body, said shaft having a portion extending obliquely to the axis of rotation of the shaft, a ring encircling said body frame structure, motion transmitting means connecting said ring with said oblique portion of said shaft, and guide means co-operating with said motion transmitting means to prevent said ring from rotating about a given axis and to permit said ring to swing bodily about the axis of rotation of the shaft and to simultaneously oscillate in another direction, jointed legs supporting said body frame structure, and a driving means having motion transmitting connections with said shaft and with said jointed legs, respectively, whereby said shaft will be rotated at a slow speed and said legs will be simultaneously bent at their joints and strightened repeatedly.

5. In a mechanical doll, a body frame structure including a cross frame member at the lower end of the body having depending hanger portions at its ends, a transverse rock shaft journaled in said hanger portions of said cross frame member, flexible legs comprising upper sections secured at their upper ends to the ends of said rock shaft, connecting plates pivotally connected with the lower ends of said upper leg sections, lower leg sections pivotally connected at their upper ends to said connecting plates underneath the lower ends of the upper leg sections, meshed gear members integral with the adjacent ends of corresponding upper and lower leg members, foot members pivotally connected with the lower ends of said lower leg members and attached to a fixed support, lower links parallel with the lower leg sections and connected pivotally with said connecting plates and said foot members, other links pivotally connected at their lower ends with said connecting plates and pivotally connected adjacent to the upper ends to the hanger portions of said cross frame member, the upper ends of said last mentioned links extending above said cross frame member, retractile springs connecting the extending upper end portions of said last named links with said body frame structure, a rocker arm carried by said rock shaft and inclined downwardly and forwardly when said legs are extended, a rotary member carried by said body frame, a crank pin

on said rotary member and a connecting rod for transmitting motion from said crank pin to said rocker arm, as and for the purpose described.

6. In a mechanical doll, a body frame structure including a cross frame member, a pair of side bars carried by said cross frame member, and an upper frame carried by said side bars, a shaft rotatably supported at its ends on said lower cross frame member and said upper frame, respectively, said shaft having a portion extending obliquely to its axis of rotation, a guide bar extending parallel to said side bars at the rear of the body frame structure, said guide bar having a vertical slot, a rod pivotally connected with said oblique portion of said shaft and extending through the slot of said guide bar, a ring encircling said guide bar and said side bars and firmly secured to the outer end of said rod, and means carried by the upper frame member for turning said shaft.

7. In a mechanical doll, a body frame structure including a cross frame member, a pair of side bars carried by said cross frame member, and an upper frame carried by said side bars, a shaft rotatably supportd at its ends on said lower cross frame member and said upper frame, respectively, said shaft having a portion extending obliquely to its axis of rotation, a guide bar extending parallel to said side bars at the rear of the body frame structure, said guide bar having a vertical slot, a rod pivotally connected with said oblique portion of said shaft and extending through the slot of said guide bar, a ring encircling said guide bar and said side bars and firmly secured to the outer end of said rod, and means carried by the upper frame member for turning said shaft, said guide bar being adapted to rock about an axis parallel to the axis of rotation of said shaft.

8. A mechanical doll comprising a body structure including a garment supporting ring located approximately at the waist line of the body and supported for movement substantially in a circle about the vertical median line of the body and for simultaneous oscillation about another axis, means within said body for moving said garment supporting ring about both axes, jointed legs supporting said body, a prime mover within said body, and motion transmitting means connecting said prime mover with the ring moving means and with said jointed legs, respectively, whereby said ring will be swung in a circle and simultaneously oscillated about another axis and said legs will be alternately bent at their joints and extended concurrently with the actuation of said ring.

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