Aug. 11, 1953 H. P. STEWART 2,648,161

ANIMATED DOLL

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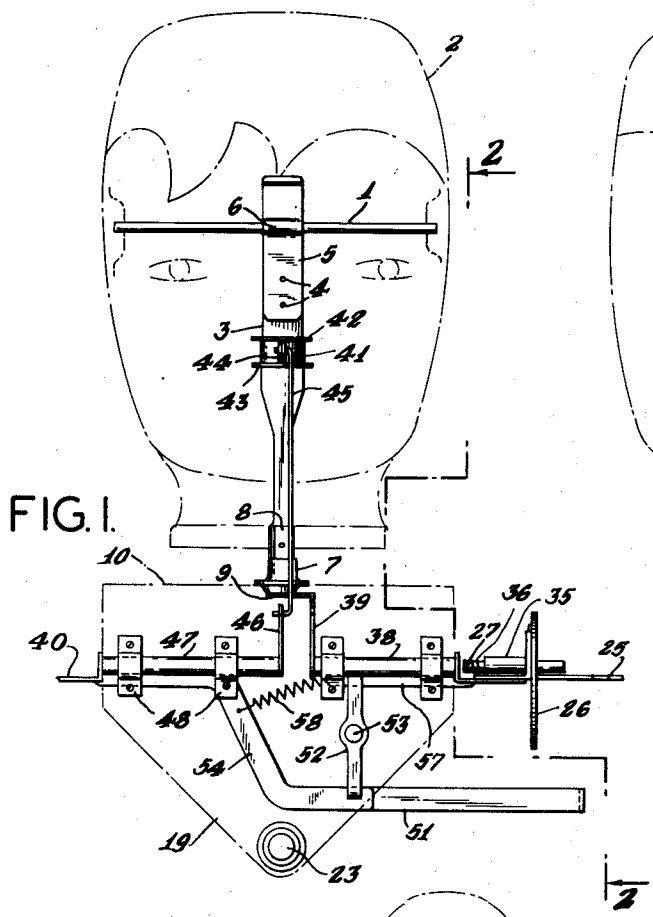


FIG. 1.

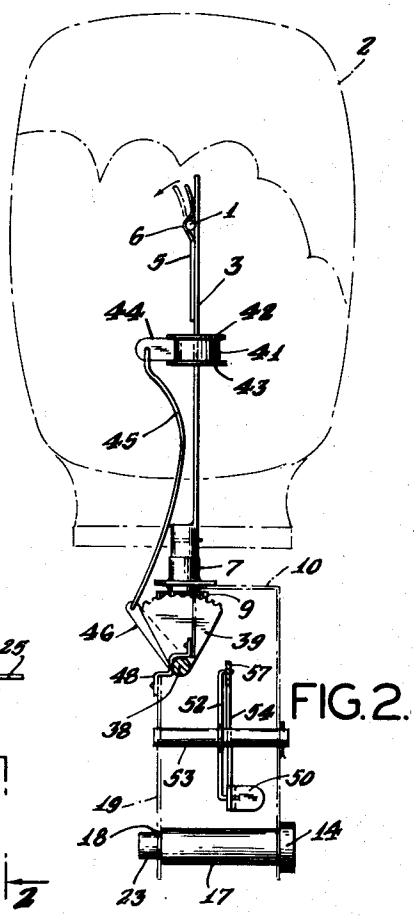


FIG. 2.

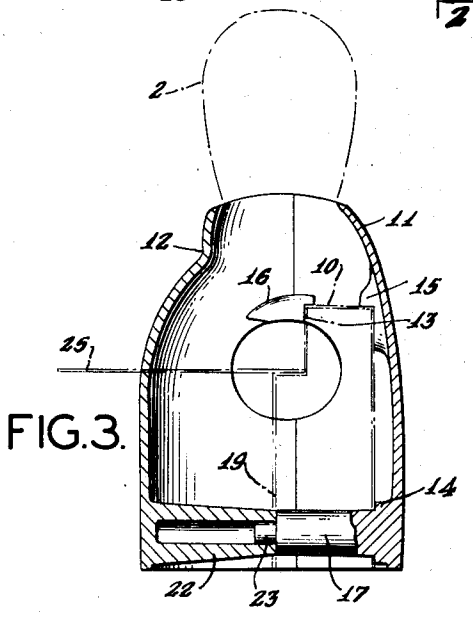


FIG. 3.

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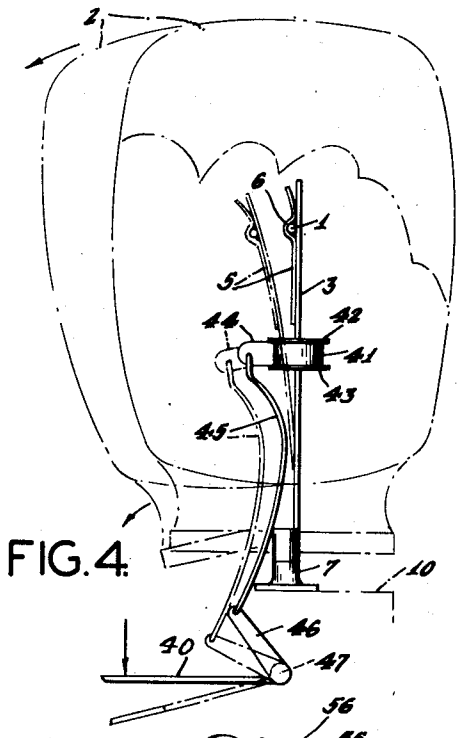


FIG. 4.

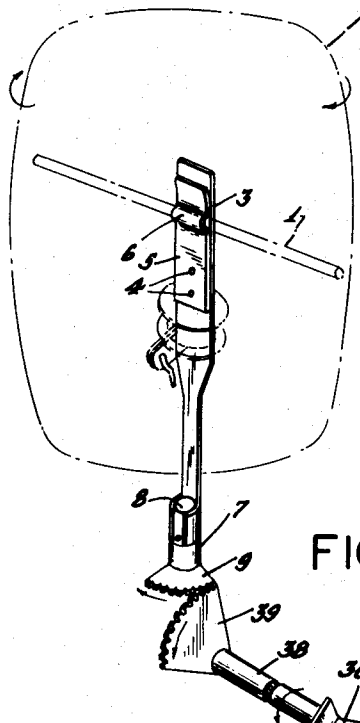


FIG. 5.

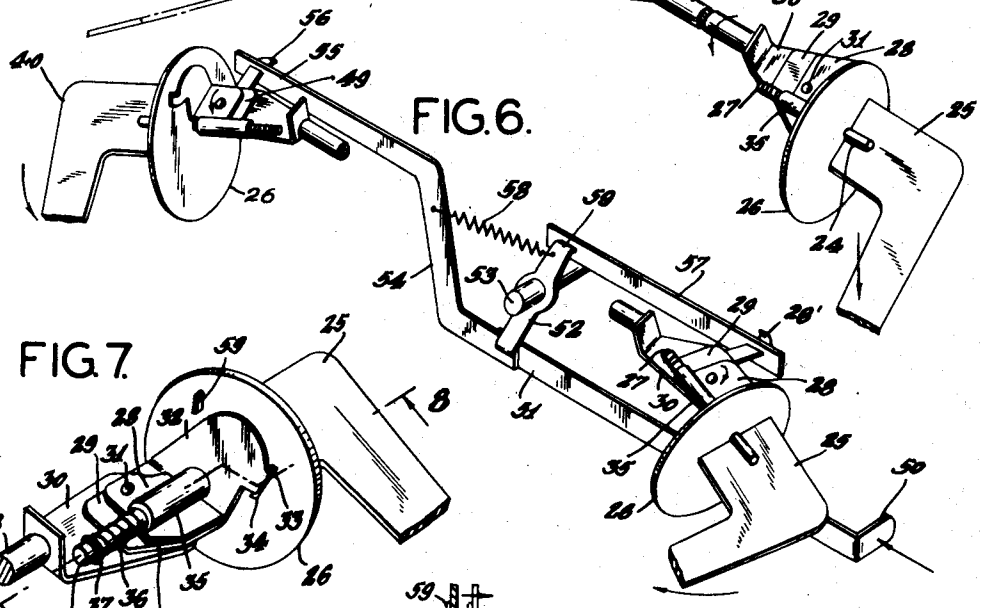


FIG. 6.

FIG. 7.

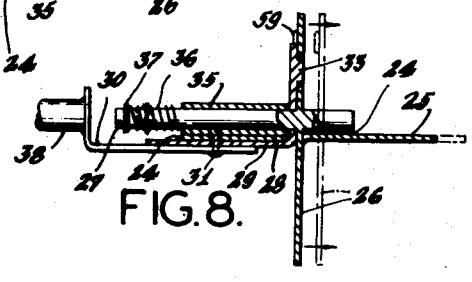


FIG. 8.

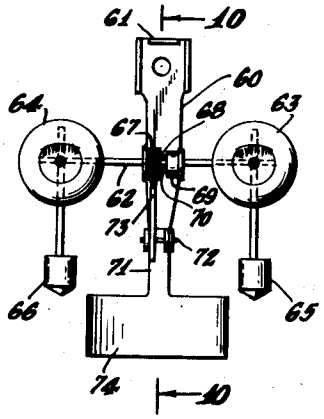
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ANIMATED DOLL

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FIG. 9.



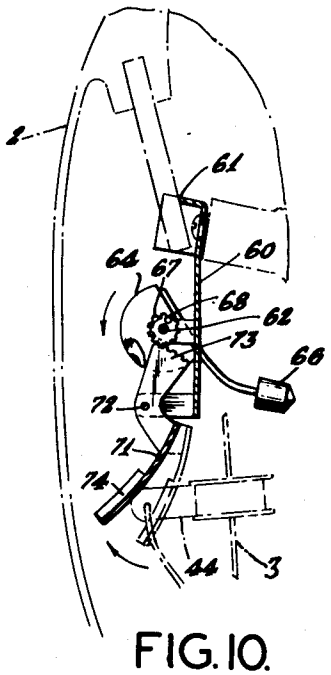


FIG. 10.

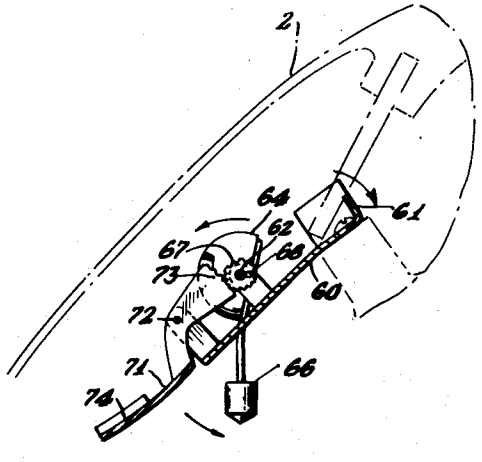


FIG. 11.

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ANIMATED DOLL

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Application November 20, 1951, Serial No. 257,368

10 Claims. (Cl. 46—120)

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This invention has to do with dolls and, more particularly with mechanism insertable within the head and body of a doll in order to provide animation.

In the animated dolls that have existed heretofore the movements were either so restricted or exaggerated as to make the doll unlifelike. One of the principal causes for this was that the mechanisms for controlling movements in the doll were cumbersome, complicated, given to getting out of working order and otherwise unsatisfactory.

It is the object of the present invention to provide a doll with animating mechanism that is simple, sturdy and reliable.

According to a feature of the invention a doll has, insertable as a unit, mechanism which may be readily and securely mounted therein. The head of the doll is supported by a resilient member projecting from the unit. Two arm members project from the unit into the doll's arms. Movement of one of the arms will cause the doll's head to turn, and movement of the other arm will cause the head to bow. There is also provided a lever which projects out from the doll's body and which may be operated to cause the arms to come together as in clapping.

According to another feature of the invention, the doll's arms may be disengaged from operative position, which is at more or less right angles to the body, and moved parallel to the body into a rest position where they will be out of the way when the doll is not in use.

According to another feature of the invention, an eye mechanism is mounted in the doll's head, which cooperates with the head supporting member so that when the doll's head is bowed its eyes will be closed. This mechanism will also operate to close the eyes when the doll is placed in a horizontal position as in sleeping.

These and other features of my invention will be made clearer from the following detailed description when taken in conjunction with the drawings, in which:

Fig. 1 is a front elevation of the animating mechanism,

Fig. 2 is a side elevation on lines 2—2 of Fig. 1,

Fig. 3 is a cross-section of a doll's torso, showing the positioning of the mechanism,

Fig. 4 is a side elevation of a portion of the mechanism that controls the bowing of the head,

Fig. 5 is a perspective view of the portion of the mechanism that controls turning of the head from side to side.

Fig. 6 is a perspective view of the mechanism

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that controls the moving of the two arms towards one another,

Fig. 7 is a more detailed view of a portion of Fig. 6,

Fig. 8 is a cross-section on lines 8—8 of Fig. 7,

Fig. 9 is a front elevation of the eye mechanism,

Fig. 10 is a side elevation of the eye mechanism with the head in bowed position and the eyes closed, and

Fig. 11 is a side elevation of the eye mechanism with the head in lying down position and the eyes closed.

The mechanism to be described comprises two units, each of which can be readily mounted within a doll's body. One unit is for the purpose of providing animation to the head and arms, and the other, an eye mechanism which is coordinated to respond in accordance with certain movements of the head. The only portion of the doll's body which will be here shown and described are the head and a portion of the torso. The doll's arms will not be shown but only those portions of the animating mechanism which are inserted in the arms of an assembled doll.

A cross-bar 1 is secured inside a doll head 2, from temple to temple. A head support 3 is of resilient material, preferably spring steel, and has fastened to its upper portion, by rivets 4, a spring steel band 5 whose upper end is bent back from support 3. As best seen in dotted lines (Fig. 2) head 2 is mounted on support 3 by pushing the support up into the head and forcing bar 1 between members 3 and 5 and into position in the space provided by convex portion 6 in band 5.

Lower end 7 of support 3 is suitably fastened to a stub shaft 8, to which is also fastened a gear segment 9. Shaft 8 is supported in a frame 10.

Frame 10 (Fig. 3) is positioned within the shell of the doll's torso, which may conveniently be divided into two halves 11 and 12. Upper portion 13 of frame 10 is held between two pairs of recessed bosses 15 and 16, respectively, in shell halves 11 and 12. Lower portion 19 of frame 10 has holes 18 permitting it to slip over a peg 17 projecting from the bottom of shell half 11 and to rest against collar 14 at the base of peg 17. A sleeve 22, extending from the bottom portion of shell half 12 fits over narrow end 23 of peg 17 to engage portion 19 of frame 10. Shell halves 11 and 12 may be held together by any suitable fastening means, e. g. glue.

The various motions of which a doll having the mechanism of the invention is capable will now

be explained with reference to the elements which control the respective movements.

The turning of the head from side to side as shown in Fig. 5 is accomplished by the up and down movement of the doll's left arm generally indicated at 25.

A shoulder disk 26 and a shaft 27 are connected to arm 25. Shaft 27 rests on plates 28, 29 and 30. Plates 28 and 29 are soldered at 24 to one another and are connected by pivot 31 to plate 30. Portion 32 of plate 29 is bent up so as to be parallel with disk 26 and has a lug or key 33 projecting therefrom adapted to fit into slot or key way 34 in disk 26. Shaft 27 passes through a journal portion 35 provided in plate 28 and is spring loaded by means of spring 36 extending between washer 37 at the end of the shaft and journal 35. There is also connected to plate 30 a shaft 38 at whose other end a gear segment 39 meshes at right angles with gear segment 9.

The bowing of the doll's head as shown in Fig. 4 is accomplished by the downward movement of the doll's right arm generally indicated at 40. The assembly of the right arm is the same as that described for the left arm 25 and will not be here repeated.

A collar 41 loosely surrounds member 3 intermediate its two ends. Circular plates 42 and 43 are fastened to member 3 on either side of collar 41 to prevent it from moving along the length of member 3. A projection 44 extends from collar 41 and one end of a head control rod 45 is attached thereto. The other end of rod 45 is connected to a link 46, which is in turn connected to a shaft 47. Shafts 47 and 38 are fastened to frame 10 by brackets 48. Shaft 47 is connected to arm 40 through mechanism similar to that described with respect to shaft 38 and arm 25.

When arm 40 is moved downwardly the doll's head 2 will be bowed as shown in dotted lines in Fig. 4. As soon as arm 40 is released the head will be returned to its normal erect position by the resiliency of support member 3.

Lever 50 extends from the doll's body just beneath arm 25 and may be operated to move arms 25 and 40 towards one another as in hand-clapping.

Lever 50 is connected at end 51 to an arm 52 mounted on pivot 53. There is also connected to the bottom of pivot arm 52 a bar 54 whose other end 55 is connected to a tongue 56 extending from plate 49. Another bar 57 is connected between upper end 59 of pivot arm 52 and a tongue 28' extending from plate 28. A spring 58 is connected between member 54 and upper portion 59 of pivot arm 52. When lever 50 is pushed in as shown by the arrow nearest it (Fig. 6) the doll's arms will be swung in towards each other as indicated by the arrows nearest them. When pressure is removed from lever 50, spring 58 restores the arms to their normal position.

In normal or operative position the arms extend at about right angles from the mechanism. In this position, as best seen in Fig. 7, key 33 fits in key way 34 of each arm. Either arm may be disengaged from operative position by pulling disk 26 back into position shown in dotted lines (Fig. 8) and rotating the disk so that the arm may be either dropped or raised to lie parallel to the doll. In either case the arms will be out of the way and in inoperative position.

A special type of eye mechanism is provided for the doll, whereby its eyes will close not only when the head is tilted back, but also when the head is bowed, as previously described.

Referring to Figs. 9–11, the eye unit is supported within the head by means of an upper member 60, which is suitably fastened as at 61 to the head. An eye supporting shaft 62 is carried in member 60 and has mounted at either end eyeballs 63 and 64 which are aligned with eye sockets (not shown) in the doll's face. Weights 65 and 66 depend from the bottom of eyeballs 63 and 64 and tend to keep the eyes in open position when the doll's head is in normal erect position. A pinion gear 67 is loosely mounted on shaft 62 and has a finger 68 projecting therefrom. A hub 69 mounted on shaft 62 turns with the shaft and has a finger 70 which engages finger 68 of pinion 67. A lower member 71 is pivotally connected at 72 to upper member 60. A gear segment 73 is rigidly connected to member 71 and meshes with pinion 67.

As best seen from Fig. 10, when the doll's head is bowed by operation of its right arm, projection 44 connected to head supporting member 3 will be moved forward as shown in dotted lines and its forward end will bear against portion 74 of member 71. Movement of member 71 in the direction of the arrow in Fig. 10 will, via gear 73, rotate pinion 67 whose finger 68 will engage finger 70 of hub 69 and in turn rotate eyeballs 63 and 64 downwardly in the direction of the arrow to simulate eye closing. As the head is returned to erect position weights 65 and 66 restore the eyes to their normal open position. Fig. 11 shows how, when the doll's head is tilted backward as in lying down, the movement of weights 65 and 66 closes the eyes. Eye support shaft 62 is free to rotate because finger 70 on hub 69 is mounted in front of finger 68 of pinion 67 and when shaft 62 is rotated counter-clockwise there is no engagement between the fingers.

Although I have illustrated and described the preferred form of my invention, it will be obvious that various changes may be made therein without departing from the spirit of the invention or from the scope of the subjoined claims.

What I claim is:

1. An animated doll having a hollow body and head for insertion of a mechanical unit, a supporting frame for said unit mounted in the torso of the doll; a resilient head supporting member extending into the head and having one end fastened thereto, the other end of said member being supported in said frame, a first arm supported from said frame, gear means connecting said arm to said head support, whereby when the arm is moved up and down the doll's head will be turned from side to side; a rod connected at one end intermediate the two ends of said head support, a second arm supported from said frame, a shaft connecting said arm to said rod, whereby when said second arm is moved down the doll's head will be bowed; a lever extending from the doll's body, a pivot member mounted in said frame and connected to said lever and to said first and second arms whereby when said lever is pushed in the arms will be moved towards one another as in clapping.

2. An animated doll having a hollow body and head for insertion of a mechanical unit, a supporting frame for said unit mounted in the torso of the doll, a resilient head supporting member extending into the head and having one end fastened thereto, the other end of said member being supported in said frame, a first gear seg-

ment connected to said last mentioned end of the head support, a second gear segment meshing with said first gear segment, a first arm supported from said frame and connected to said second gear, whereby when the arm is moved up and down the doll's head will be turned from side to side; a rod connected at one end intermediate the two ends of said head support, a second arm supported from said frame, a shaft connecting said arm to said rod, whereby when said second arm is moved down the doll's head will be bowed; a lever extending from the doll's body, a pivot arm mounted in said frame and connected to one end of said lever, a first bar connected between one end of said pivot arm and said first arm of the doll, a second bar connected between the other end of said pivot arm and said second arm of the doll whereby when said lever is pushed in the arms will be moved towards one another as in clapping.

3. An animated doll having a hollow body and head for insertion of a mechanical unit, a supporting frame for said unit mounted in the torso of the doll and positioned by recessed bosses in the torso engaging the upper portion of the frame and a peg and sleeve arrangement projecting from the torso to engage the bottom portion of said frame; a cross bar inside the head at about the level of the temples; a spring steel head supporting member extending into the head and fastened at one end of said cross bar, the other end of said member being supported in said frame, a first arm supported from said frame, a first gear segment connected to said last mentioned end of the head support, a second gear segment meshing with said first gear segment, a first shaft connected at one end to said second gear, key means in the other end of said first shaft to cooperate with said key, key way means in said first arm of the doll, spring means urging said key into the key way, whereby when said key is in the key way and the arm is moved up and down the doll's head will be turned from side to side; a rod connected at one end intermediate the two ends of said head support, a link connected to the other end of said rod, a second shaft connected at one end to said link and at the other end to the other arm of the doll similarly to the connections for said first arm, whereby when the arm is moved down the doll's head will be bowed; a lever extending from beneath one of the doll's arms, a pivot arm mounted in said frame and connected to one end of said lever, a first bar connected between one end of said pivot arm and said first arm of the doll, a second bar connected between the other end of said pivot arm and said second arm of the doll whereby when said lever is pushed in the arms will be moved towards one another as in clapping.

4. An animated doll having a hollow body and a head movable through a plurality of positions and adapted to have inserted therein a mechanical unit, a supporting frame for said unit mounted in the torso of the doll and positioned by recessed bosses in the torso engaging the upper portion of the frame and a peg and sleeve arrangement projecting from the torso to engage the bottom portion of said frame; a cross bar inside the head at about the level of the temples; a spring steel head supporting member extending into the head and fastened at one end to said cross bar, the other end of said member being supported in said frame, a first gear segment connected to said last mentioned end of the head support, a second gear segment meshing with said first gear segment, a first shaft connected at one end to said second gear and at the other end to a first plate, second and third plates superimposed on said first plate and pivotally connected thereto, a first shoulder disk having a key way, a key on said third plate adapted to enter said key way, a first rigid member corresponding to the doll's arm fastened to said first disk, a first spring loaded shaft extending from said disk and urging said key into the key way, whereby when said key is in the key way and the arm is moved up and down the doll's head will be turned from side to side; a rod connected at one end intermediate the two ends of said head support, a link connected to the other end of said rod, a second shaft connected at one end to said link and at the other end to a second rigid member corresponding to the other arm of the doll similarly to the connections for said first rigid member, whereby when the arm is moved down the doll's head will be bowed, a lever extending from beneath one of the doll's arms, a pivot arm mounted in said frame and connected to one end of said lever, a first bar connected between one end of said arm and a first tongue on said first plate, a second bar connected between the other end of the arm and a second tongue on the plate corresponding to said last mentioned plate and connected to the second arm, and a spring connection between one of said bars and the end of said pivot arm connected to the other bar, whereby when said lever is pushed in the arms will be moved towards one another as in clapping.

5. The device according to claim 4, and in which said arms have an operative position and a rest position, in operative position said keys for each arm being in their respective key ways, and in rest position disengaged therefrom.

6. The device according to claim 4, and an eye mechanism in the head comprising a member fastened to the head, eye balls having open and closed positions rotatably mounted on said member, and means for closing the eyes when the head is bowed relative to said body in response to movement of one of said arms.

7. The device according to claim 4, and an eye mechanism in the head comprising a first member fastened to the head, eye balls having open and shut positions rotatably mounted on said member, a weight depending from each of said eye balls, a second member pivotally connected to said first member, gear means interconnecting said two members, and means connected to said head supporting member for closing the eyes when the head is bowed.

8. The device according to claim 4, and a projection connected to said head supporting member cooperating with an eye mechanism in the head comprising a first member fastened to the head, an eye supporting shaft carried by said first member, eye balls having open and shut positions rotatably mounted at either end of said shaft, a weight depending from each of said eye balls, a first gear mounted loose on said shaft, a first finger projecting from said gear, a hub fastened to said shaft, a second finger projecting from said hub and adapted to engage said first finger, a second member pivotally connected at one end to said first member, second gear means connected to said second member and meshing with said first gear whereby when the head is bowed said projection engages said second member and said second gear will operate said first gear to rotate the eyes into closed position.

9. An animated doll comprising a hollow body portion, a supporting frame secured within said body portion, a flexible member journaled on said frame, a hollow head secured on said flexible member, an arm including a shaft journaled on said frame, means connecting said shaft to said flexible member whereby said head is adapted to turn in response to up and down movement of said arm, a second arm including a shaft journaled on said frame, a crank lever secured to the inner end of said second named shaft, a link member pivotally connected to and between said flexible member and said crank lever, whereby said head is adapted to be bowed in response to downward movement of said second named arm, a member pivoted to said frame intermediate its ends, a lever pivotally connected to one end of said pivoted member and extending outwardly of said body, a link connected to each end of said pivoted member with the opposite

ends thereof pivotally connected respectively to said first and second named arms whereby manipulation of said pivoted lever will cause the free ends of said arms to come together to simulate hand clapping.

10. The invention set forth in claim 9, characterized in that each arm supporting shaft and arm includes a yieldable coupling means therebetween whereby said arms are adapted for relative movement into an inoperative position parallel with said body portion.

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