Sept. 9, 1930. A. C. WOOLGAR 1,775,580

EYE CONTROLLING MECHANISM FOR FIGURE TOYS

Filed Aug. 29, 1929

Fig. 1.

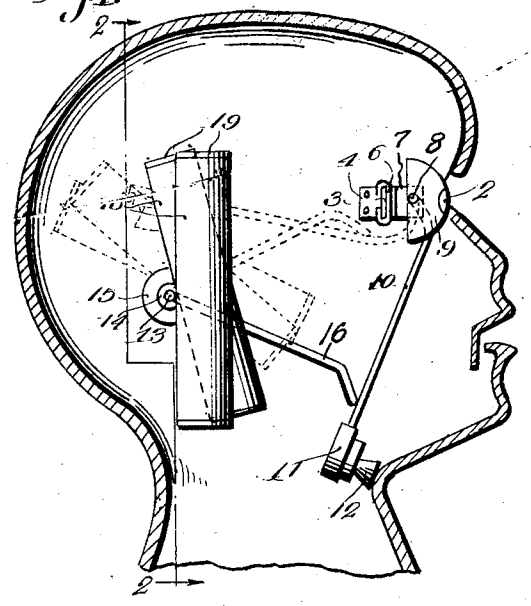


Fig. 3.

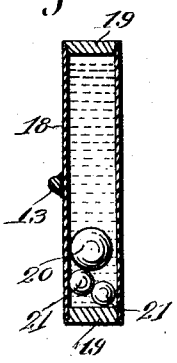


Fig. 2.

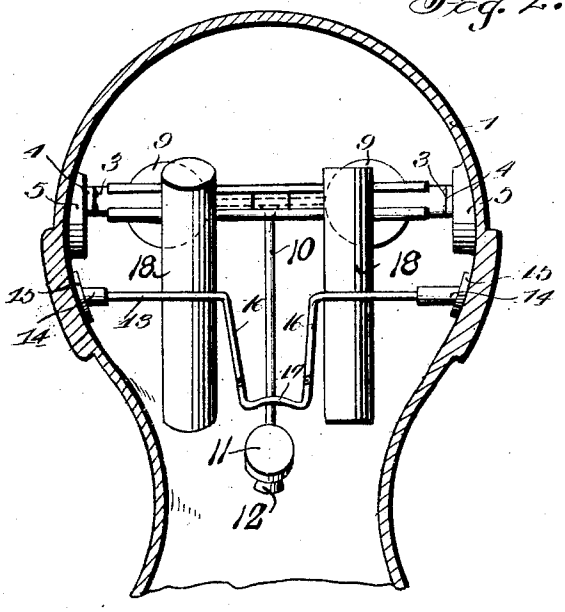
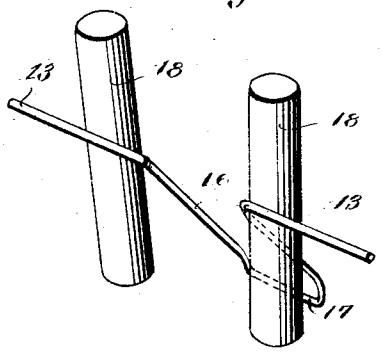


Fig. 4.



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EYE-CONTROLLING MECHANISM FOR FIGURE TOYS

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My invention relates to that class of figure toys, such as dolls, in which the eyes are made to close and simulate sleep when the toy doll is changed from an upright or eye opened position to a recumbent or eye closed, sleeping position.

As at present practised, the eyes are mounted within hollow heads on rock shafts from which weighted crank arms extend, the changing of the position of the doll from an upright to a recumbent one, and vice versa, causing the weighted crank arm to rock its shaft and turn the eyes from an "open" to a "closed" position and vice versa.

In accordance with the present invention, I have provided an abutment member positioned in the path of eye-closing movement of the weighted crank arm and progressively movable with said abutment along its closing path at a retarded rate of speed so that the eye "closing" movement is slow and gradual, simulating the drowsing to sleep of a young child and enabling the little user of the doll to play at singing or talking the "baby" to sleep during this retarded eye closing period.

The retarding mechanism, furthermore, is so designed as to permit the eyes to "close" gradually when the toy doll is not fully recumbent or horizontal, as when held in a child's arms somewhat inclined to the horizontal when being "put to sleep".

The invention consists in the structural features, arrangements and combinations of parts as hereinafter described and claimed, and will be more clearly apparent from the following detailed specification which is to be read in conjunction with the accompanying drawings forming part thereof and in which:—

Figure 1 is a longitudinal vertical section through a hollow doll head having the eye controlling mechanism of the present invention mounted therein.

Figure 2 is a transverse vertical section taken on the line 2—2 of Figure 1.

Figure 3 is a vertical section through one of the liquid check tubes, and

Figure 4 is a perspective detail of the pair of relatively inclined check tubes and their attached rock shaft and abutment arm.

In Figures 1 and 2 of the drawings, 1 indicates the usual composition hollow head of a toy doll, the eye openings being shown at 2. Within the head rearwardly of the eye openings 2, a metal bar 3 extends transversely of the head and has its ends provided with rearwardly turned ears 4 which are fixed to enlargements 5 as by the fastenings shown. Between the ends of bar 3, a metal plate 6 is applied to its outer face, the upper and lower edges being bent over the bar edges to fasten thereto. From the outer face of plate 6, a pair of spaced ears 7 extend forwardly and are drilled in alinement to provide bearings for a rod or rock shaft 8 journaling therein and having fixed thereon at points in line with the eye openings 2, a pair of semi-spherical artificial eyes 9. Between the bearing ears 7, the upper end of a crank arm 10 is secured to the rock shaft 8 from which it depends. On its lower end is mounted a weight 11 faced by a cushioning buffer 12 to impact the inner face of the head. The described specific construction is one in common use and forms no part of the present invention, but represents a standard form of an eye-mounting rock shaft having a weighted eye-oscillating crank arm with which the retarding means now to be described operates in combination.

Rearwardly of and below the bar 3, a second rock shaft in the form of a wire or rod 13 traverses the interior of the head 1 in parallel with the bar 3 and has its ends journaled in alined socket bearings 14 formed in plates 15 secured by suitable means to the inside face of the head at transversely alined points as shown in Figure 2.

Intermediate of its ends and in line with the weighted arm 10 of the eye mounting rock shaft 8, this second rock shaft 13 is bent outwardly as a crank to form an abutment arm 16 whose cross bar 17 is in line with the weighted lever arm 10 of the eye-mounting rock shaft 8 in the direction of movement of said arm to rock the eyes 9 to "closed" position.

Mounted on the rock shaft rod 13 at opposite sides of its abutment arm are a pair of check tubes 18 in the form of closed cylinders traversing the rod 13 and affixed therein in balanced relation as by soldering thereon at points midway of their length. The ends of the cylinders are closed by plugs 19 and their interiors are filled with fluid such as oil and sliding counter-balancing weights such as spherical balls and including one ball weight having a diameter approximating that of its cylinder to provide a restricted passage for the fluid therebeyond when the tube is tilted to cause the weight to slide downwardly therein by gravity, and preferably a number of smaller ball weights 21 further to impede the upflow of fluid. The passage of these ball weights from one end to the other of the tubes functions to rock the shaft 13 and swing its abutment arm, the normal gravity operated rate of rocking and swinging movement being substantially retarded and checked by the resistance offered to the sliding of the ball weights by the displacement thereby of the cylinder fluid and the restricted displacement passage therefor between the ball weight and cylinder walls.

This tilting of the cylinders and the consequent rocking of shaft 13 and swinging of its abutment arm occurs when the toy doll is moved from and upright to a recumbent position and vice versa, the inclination of the cylinders from or toward the vertical causing the wall weights by gravity to slide toward opposite ends of the cylinders, overbalancing and tilting the cylinders and rocking shaft 13, the normal gravity actuated rate of sliding movement being greatly retarded by the fluid check provided by the necessity of forcing oil or other fluid displaced by the ball weights upwardly through a restricted escape passage.

In the upright position of the toy figure, the ball weights position the tubes 18 substantially in the vertical axis of the head as shown in Figure 1, with the cross bar 7 of the abutment arm closely adjacent to the weighted arm 10 of the eye-mounting rock shaft 8. Tilting of the toy figure head from the upright toward a recumbent position will cause the ball weights in the check tubes 18 to slide downwardly slowly, retarded by the fluid check provided, and will slowly rock the shaft 13 and tilt its abutment arm upwardly in the direction of eye-"closing" movement of weight arm 10, permitting said arm, by gravity, slowly to rock its shaft 8 and turn the eyes 9 toward "closed" position, as permitted by the retarded movement of the abutment arm, the eyes thus simulating the slowly closing eyes of a child drowsing off to sleep.

In order that the eyes may close with the toy figure held at an intermediate point of inclination between the horizontally recumbent and upright positions, one of the check tubes 18 is, as shown, mounted on its rock shaft to incline rearwardly from the vertical in the upright position of the toy figure. Thus, if the toy figure is held in a child's arms inclined somewhat upwardly from the horizontal to be "put to sleep", this rearwardly inclined tube will function to impart a retarded full tilting movement to the abutment arm and permit the eye-mounting rock shaft 8 to be swung by its gravity actuated weighted arm to full eye-closing position with the toy figure only partially lowered toward the fully horizontal recumbent position.

The abutment arm only retards the movement of the weighted arm 10 in eye-closing direction. When the toy figure is moved from recumbent to upright position, the eyes are swung to "open" position by the weighted arm 10 at its normal gravity actuated speed, the ball weights in the check tubes 10 returning the tubes, rock shaft and abutment arm to the initial positions shown in Figures 1 and 2 at a retarded rate of speed as previously described.

The retarding means herein described and shown, while representing a preferred embodiment of the invention, is intended as illustrative rather than restrictive thereof and is subject to structural variation and modification in consonance with the spirit of the invention and the scope of the appended claims.

What I claim, therefore, and desire to secure by Letters Patent is:

1. Eye controlling mechanism for the heads of figure toys comprising a rock shaft mounted within the head portion and having artificial eyes mounted thereon, a weighted arm extending from said rock shaft and normally, by gravity, tending to rock said shaft and oscillate said eyes to "open" and "closed" positions in the upright and recumbent positions, respectively, of the toy figure, a second rock shaft mounted in said head portion having an abutment arm extending therefrom to abut and extend in the path of eye closing movement of said weighted lever arm and progressively movable with the weighted arm in eye closing direction, and a motion retarding element mounted in balanced position on and traversing the second rock shaft and mounting a sliding gravity actuated weight to cause rocking of said shaft and continuous swinging of its abutment arm in the eye closing direction of movement of said weighted arm, upon movement of the toy figure toward a recumbent position and in response to pressure of the weighted arm against said abutment arm, and means providing a fluid check for retarding without stopping the normal sliding movement of said weight and rocking of said second shaft in said eye closing direction.

2. In a head for figure toys having an eye mounting rock shaft therein provided with a weighted arm actuated by gravity to rock said shaft and oscillate said eyes to "open" and "closed" positions, respectively, when the toy figure is held in upright and recumbent positions, a second rock shaft mounted within the head portion having an abutment arm extending outwardly therefrom into the path of eye closing movement of said weighted arm and movable by and with said arm in response to the gravity weight pressure thereof, a fluid cylinder mounted in balanced position on and traversing said second rock shaft, and a sliding weight in said fluid cylinder providing a restricted passage thereby for fluid and normally, by gravity, rocking said second shaft to position its abutment arm adjacent the weighted arm of the first rock shaft in the "open" eye position of said arm and in the direction of movement of said weighted arm to eye "closing" position.

3. In a head for figure toys having an eye mounting rock shaft therein provided with a weighted arm actuated by gravity to rock said shaft and oscillate said eyes to "open" and "closed" positions, respectively, when the toy figure is held in upright and recumbent positions, a second rock shaft mounted within the head portion having an abutment arm extending outwardly therefrom into the path of eye closing movement of said weighted arm and movable by and with said arm in response to the gravity weight pressure thereof, a fluid cylinder mounted in balanced position on and traversing said second rock shaft, and a sliding weight in said fluid cylinder providing a restricted passage thereby for fluid and normally, by gravity, rocking said second shaft to position its abutment arm adjacent the weighted arm of the first rock shaft in the "open" eye position of said arm and in the direction of movement of said weighted arm to eye "closing" position, said cylinder being mounted on said rock shaft to extend at an angle to the vertical axis of the head in the "open" eye position of the first rock shaft inclined in the direction of swinging movement of its weighted arm to eye "closing" position, thereby to swing said abutment arm in a direction to permit eye "closing" movement of the weighted arm with the head of the toy figure held at an angle to the horizontal between the vertically upright and horizontally recumbent positions of the toy figure.

4. Eye controlling mechanism for figure toys having hollow head portions comprising a rock shaft mounted within the hollow head portion, artificial eyes mounted on the rock shaft, a weighted lever arm connected to and extending from said rock shaft and normally by gravity tending to rock said shaft and turn said eyes to "open" and "closed" positions in the upright and recumbent positions, respectively, of the toy figure, and means within said hollow head cooperating with said weighted lever arm and effective, when the toy figure is moved to recumbent position, to cause continuous gravity operated rocking of said rock shaft to eye "closed" position but at retarded speed.

5. Eye controlling mechanism for hollow head figure toys comprising a rock shaft journaled within the hollow head mounting artificial eyes thereon and having a weighted arm extending therefrom and normally by gravity tending to rock said shaft and oscillate said eyes to "open" and "closed" positions in the upright and recumbent positions, respectively, of the toy figure, a swinging abutment positioned in and continuously movable along the path of eye closing movement of said weighted arm by and with said weighted arm, and means within said head cooperating with said swinging abutment and effective to decreasingly retard the speed of the continuous swinging movement imparted thereto by said weighted arm in the gravity operated movement of said arm to eye "closing" position.

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