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A. F. WASHBURN

2,994,158

ROCKING MEANS FOR CLOSING DOLL EYES

Filed May 25, 1959

2 Sheets-Sheet 1

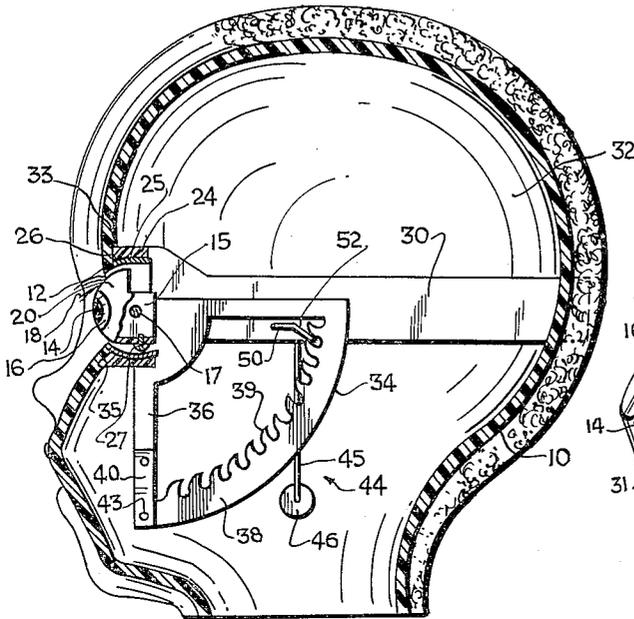


Fig. 1.

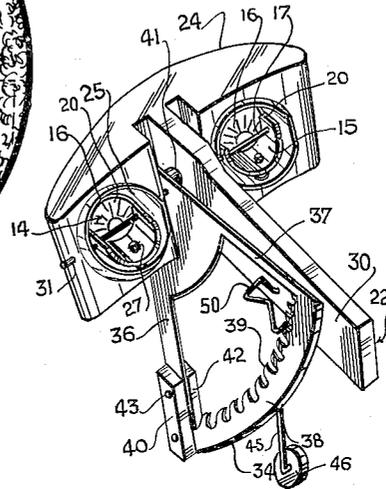


Fig. 2.

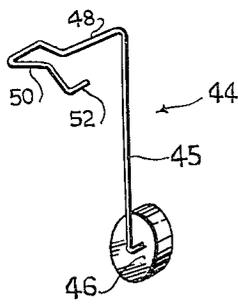


Fig. 5.

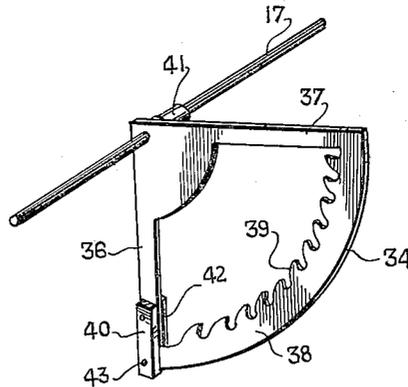


Fig. 3.

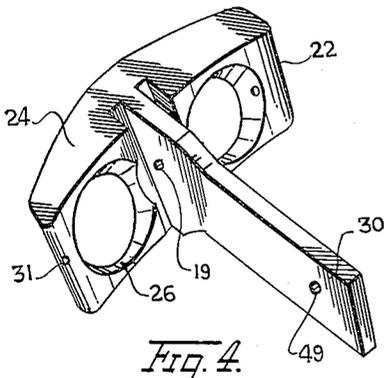


Fig. 4.

INVENTOR.
ALFRED FRISER WASHBURN

BY *Gustav A. Polasky*
ATTORNEY

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A. F. WASHBURN

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2 Sheets-Sheet 2

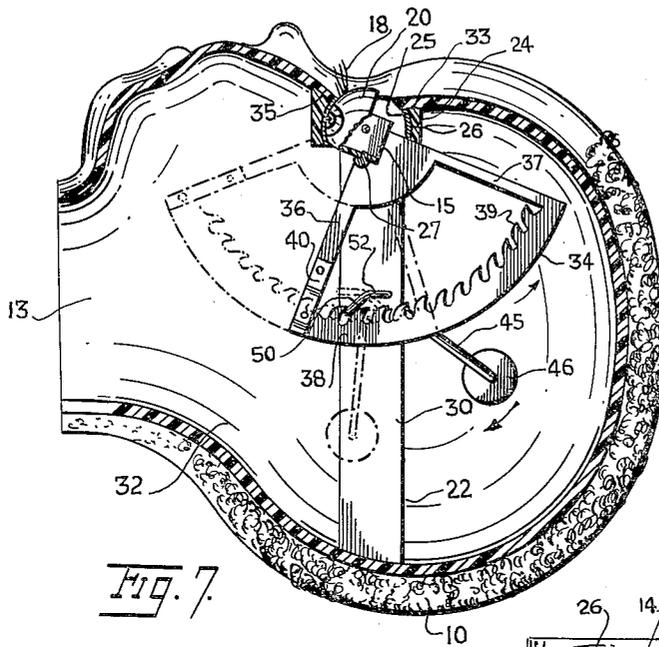


Fig. 7.

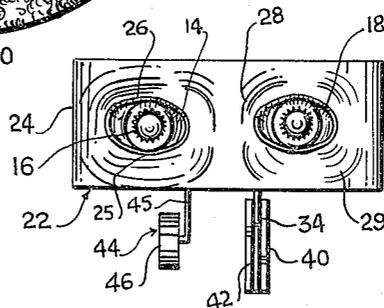


Fig. E.

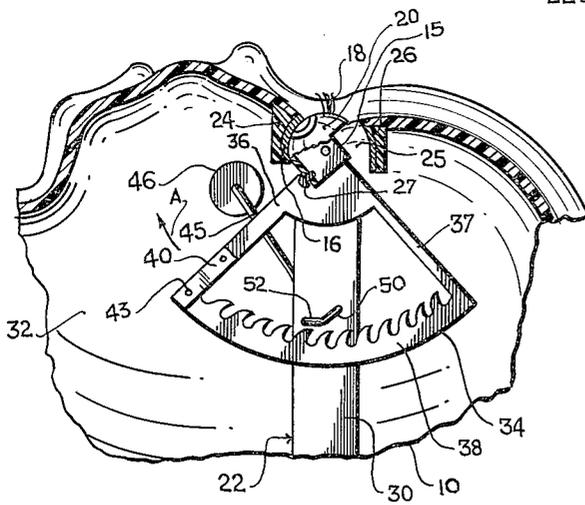


Fig. B.

INVENTOR.
ALFRED FRISER WASHBURN

BY

Golden P. Polachsky

ATTORNEY

1

2,994,158

ROCKING MEANS FOR CLOSING DOLL EYES

Alfred Fraser Washburn, Old Tappan, N.J.

(1023 E. 8th Ave., Mount Dora, Fla.)

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1 Claim. (Cl. 46-169)

This invention relates to the art of animated dolls and particularly concerns a new and improved eye closing and opening mechanism for a doll.

In animated dolls known heretofore, various attempts have been made to provide eye opening and closing mechanism which would simulate the eye motions of an infant on being rocked to sleep and on being awakened. The prior known mechanisms have not proven wholly successful because rather unnatural movements were required to be imparted to the doll's body and the responses of the eye mechanisms only crudely approximated natural eye movements. In some dolls, it was necessary to rock the doll rather violently in order to actuate a mechanism which controlled eye movement. In other dolls, the eyes closed rather suddenly instead of closing gradually in a more natural type of movement. In still other dolls, it was required to rock the doll from side to side rather violently in a difficult and unnatural motion to effect closing of the eyes.

According to the present invention, there is provided an improved eye closing and opening mechanism for a doll. The doll is rocked lengthwise or end to end while cradled in a natural, comfortable horizontal position in a child's arms. Gentle rocking movements lengthwise at a regulated rate of speed cause the eyes to close gradually a step at a time until the doll is fully "asleep." If the "sleeping" doll is raised to vertical position from the horizontal position, the doll "wakes up" and the eyes open at once. If the doll while "asleep" is jarred in a lengthwise direction or shaken, this also "wakes up" the doll and the eyes open at once. All these motions of the doll's body and responsive movements of the eyes are such as a child can perform and will find most realistic in simulating the responses of a live infant, more so than has been possible of attainment with prior known animated dolls of this type.

It is therefore a principal object of the invention to provide an animated doll having eyes adapted for falling asleep responsive to gentle lengthwise rocking movements of the doll in a horizontal position and adapted for instantly awakening when returned to a vertical position or when shaken or jarred.

It is a further object to provide as an article of manufacture, an eye closing and opening mechanism adapted for closing the eyes of a doll in discrete steps responsive to gentle lengthwise rocking movements of the doll.

Another object is to provide a frame supporting the mechanism for closing the eyes carried in the frame, the frame being part of a doll's head or being adapted for insertion in a soft doll's head for adding thereto the eye closing mechanism.

It is another object to provide an eye closing and opening mechanism for a doll, wherein said mechanism includes a weighted, gravity-biased escapement member controlled by pallet elements actuated by a massive pendulum body upon rocking of the mechanism to close the eyes.

A still further object is to provide an eye closing and opening mechanism for a doll, wherein the mechanism includes a weighted multiple toothed escape member controlled by a pendulum having a wire shaft or stem formed with pallet elements, the pendulum being pivotable to permit the member to move freely in one direction and to be moved a tooth at a time in the opposite direction.

For further comprehension of the invention, and of the

2

objects and advantages thereof, reference will be had to the following description and accompanying drawings, and to the appended claim in which the various novel features of the invention are more particularly set forth.

In the accompanying drawings forming a material part of this disclosure:

FIG. 1 is a vertical sectional view of a doll's head embodying the invention, the section being taken through the left eye opening in the doll's head, the eye of the doll being shown only partially in section.

FIG. 2 is a perspective view of the frame and associated eye operating mechanism employed in the doll's head of FIG. 1.

FIG. 3 is a perspective view of the escapement member employed in the mechanism.

FIG. 4 is a perspective view of the frame employed as the support for the mechanism.

FIG. 5 is a perspective view of the pendulum.

FIG. 6 is a front elevational view of the frame and associated eye operating mechanism supported thereby.

FIG. 7 is a sectional view similar to FIG. 1 but showing the doll's head in a horizontal or "asleep" position.

FIG. 8 is a fragmentary sectional view of the doll's head similar to a portion of FIG. 7 showing the head in a horizontal position but with the mechanism being actuated to effect instant opening of the eyes.

In FIG. 1 there is shown a portion of a doll's head in an upright position. The head is hollow and preferably formed of soft, plastic material simulating human skin. It has an open neck 13. The head is formed with eye sockets 12 in which are pivotally disposed eyeballs 14. The eyeballs have lower portions 16 colored and formed as eye pupils. Just above the pupils are attached forwardly extending eyelashes 18. The upper portions of the eyeballs above the eyelashes are blank and colored to simulate eyelids. When the doll's head is in an upright position as shown in FIG. 1, the pupils 16 are exposed at the eye openings so that the doll appears "awake."

The eyeballs are supported and moved by a mechanism which includes a frame or frame structure 22 shown to best advantage in FIGS. 1, 2, 4 and 6. This frame is generally T-shaped in plan view. The cross member 24 of the frame is formed with oval or round eye openings 26 and its outer side is shaped to define a nose bridge 28 and adjacent curved cheek portions 29. The pedestal 30 of the frame is an elongated bar whose length is sufficient so that its free end can be engaged at the rear of the doll's head in the cavity 32. The cross member 24 is normally seated in recesses 33 and 35 formed in the inner wall of the front of the head, with the eye openings 26 aligned with the eye sockets 12 of the head. The frame is thus entirely concealed behind the doll's face.

The eyeballs 14 are hollow shell-like members having rearwardly extending semicylindrical portions 15. Extending through and engaged in these eye portions 15 are the ends of a shaft 17. The shaft passes through an opening 19 in the bar 30 and is journaled for pivotal movement in openings 31 in member 24. Mounted on the shaft 17 and disposed perpendicular thereto is an escapement member 34. This member is a frame-like structure in the form of a quadrant or 90° sector of a circle. It has two straight lateral arms 36, 37, and an arcuate portion 38 integrally formed with the outer ends of arms 36, 37. The inner edge of the arcuate portion 38 is formed with teeth 39 slanted toward arm 37. A pair of weights 40, 42 are secured to one corner of member 34 by rivets 43. The weights are located on arm 36. The center of gravity of the member 34 and weights is in the weights so that when the member is freely suspended from the shaft 17, the member tends to assume a position substantially as shown in FIG. 1 with arm 36 vertical. The

3

shaft 17 passes through the apical end of member 34, which is spaced from bar 30 by spacer 41 on the shaft 17. The eyeballs 14 are rotatable in generally cylindrical short tubes or sleeves 25 secured in the eye openings 26 of the cross member 24. Pins 27 in portions 15 limit rotation of the eyes.

An escapement piece 44 is provided for advancing the escapement member 34 a step or tooth at a time in angular movement in a vertical plane with respect to the frame structure 22. This escapement piece, as best shown in FIGS. 1, 2, 3 and 5, includes a stem or shaft 45 made of stiff wire. At one end of the stem is secured a weight 46 which constitutes the piece a pendulum. The other end of the stem is bent to form a bearing portion 48 and a pallet portion having two loops 50 and 52 forming two angularly disposed pallet elements. The bearing portion 48 extends through an opening 49 in the bar 30 and the pallet portion extends laterally from the bar so that one looped element or the other normally engages between a pair of teeth 39. The pendulum is suspended in the bar for swinging freely so that as one element 50 leaves the teeth the other element 52 engages therein and vice versa. When the escapement arm 37 is vertically disposed with weights 40, 42 in an elevated position, the weights will tend to rotate the escapement member to lower its center of gravity; this condition will obtain as the doll head is rotated 90° in a vertical plane from the vertical or upright position of FIG. 1 to the horizontal or supine position of FIG. 7.

When the doll's head is so turned or tilted, the escapement member which is initially in the upper dotted line position shown in FIG. 7, will tend to move to the lower full line position shown therein. This movement will be limited by the engagement of the pallet elements 50, 52 with teeth 39. In order to effect the movement of the escapement member, a swinging movement must be imparted to the escapement piece 44. This is accomplished by gently rocking the doll's head to and fro in a horizontal plane longitudinally in an end-to-end direction. As the weight 46 swings, the escapement member is advanced gravitationally a step at a time in a counterclockwise direction as viewed in FIG. 7. Since the eyeballs 14 are secured on the same shaft 17 as the escapement member it will be apparent that the eyeballs will rotate, with the escapement member from the open position of FIG. 1 to the closed position of FIG. 7, in which the eyelid portions 20 are exposed at the eye openings.

If the doll's head 10 should be raised from the horizontal position of FIG. 7 to the vertical position of FIG. 1, the doll will instantly awaken. This will occur because of slippage of the inclined teeth 39 past the pallet elements 50, 52 as the weights 40, 42 gravitationally draw the member 34 in a clockwise direction to the position shown in FIG. 1. Thus, the doll is brought from the "sleep" condition in which the eyes are closed to the "awake" condition in which the eyes are opened by turning the head to an upright position.

FIG. 8 illustrates another way in which the doll is "awakened." If the eyes are closed, but the doll is suddenly jarred or shaken in a horizontal direction, the weight 46 will be swung upwardly as shown in FIG. 8 so that the pallet elements 50 and 52 are clear of the teeth 39; the impulse imparted to the doll will cause the weights 40, 42 to swing upwardly as indicated by arrow A and the result will be an instant "awakening" of the doll as the pupils 16 become exposed at the eye openings of the doll.

The mechanism thus provides a means whereby gentle rocking in a horizontal to and fro direction causes the eyes to close gradually, while abruptly shaking or jarring the doll in a horizontal direction and turning the doll from a horizontal to a vertical position, will cause the eyes to open instantly. A particular characteristic and advantage of the present invention is that the mechanism can be manufactured as a separate structure on its own

4

frame and can be inserted into a fabricated doll's head and secured in recesses provided therefor. The frame can be cemented in place or if the doll's head is sufficiently elastic, it can be held in the head by a snug fit maintained by the elasticity of the head. A further advantage of the present mechanism is the reduced number of parts and relative simplicity thereof as compared with prior known mechanisms of similar character. This reduces its cost, and insures longer life and longer, trouble-free use.

While I have illustrated and described the preferred embodiment of my invention, it is to be understood that I do not limit myself to the precise construction herein disclosed and that various changes and modifications may be made within the scope of the invention as defined in the appended claim.

Having thus described my invention, what I claim as new, and desire to secure by United States Letters Patent is:

An eye closing and opening mechanism for a doll responsive to gentle rocking movements longitudinally of the body of the doll to close the eyes of the doll in successive steps, to open the eyes instantly when the doll is raised to a vertical position from a horizontal position while the eyes are closed, and to open the eyes instantly when the doll is jarred in a horizontal longitudinal direction while the eyes are closed, comprising a generally T-shaped frame having a pedestal and cross member, said cross member having spaced eye openings therein, a shaft pivotally mounted in the pedestal and extending through the cross member across said eye openings, a pair of eye units secured to opposite end portions of the shaft and disposed rotatably in said eye openings, said eye units having pupil portions and blank eyelid portions, a flat arcuate frame-like escapement member defining substantially a quadrant of a circle, said member being secured perpendicularly to said shaft and disposed parallel to said pedestal, said escapement member having internally directed teeth on an arcuate portion thereof, a weight secured to one corner of said escapement member; and an escapement control piece having a bearing portion pivotally carried by said pedestal, a stem perpendicular to the bearing portion and parallel to the pedestal, pallet elements angularly disposed to the bearing portion and engaged alternately with said teeth for advancing the escapement members in steps in a single plane perpendicular to said shaft, and a pendulum secured to the stem and pivoting the stem and pallet elements in planes parallel to the pedestal and plane of said escapement member, said escapement control piece controlling stepped advancement of the escapement member while the escapement member is being angularly urged in one direction in its plane perpendicular to the shaft by said weight, said stem being rotatable on said bearing portion in one of said planes to one position where said pallet elements disengage from said teeth to permit the escapement member to pivot freely in another direction opposite from said one direction, said member pivoting freely in said another direction when the pendulum is jarred in said another direction with sufficient force to rotate the stem and disengage the pallet elements from said teeth, said eye units being movable by said escapement member in a single sudden movement between closed and open positions when the pallet members are disengaged from said teeth, said pupils being exposed in said eye openings in the open position of the eye units, said eyelid portions being exposed in said eye openings in the closed position of the eye units.

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