

July 5, 1949.

I. F. MANDELL

2,475,508

DOLL'S HEAD

Filed Feb. 8, 1944

Fig. 1.

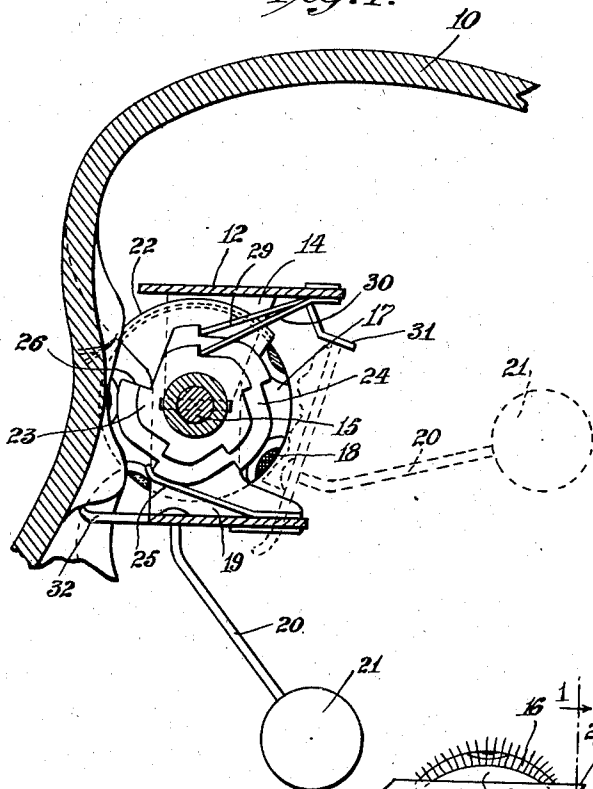


Fig. 4.

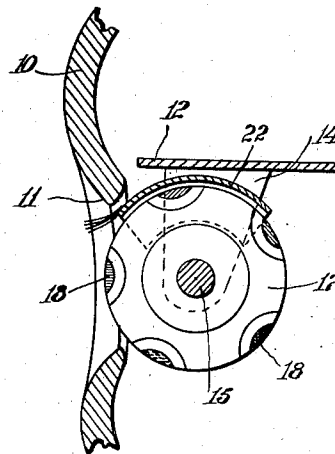


Fig. 2.

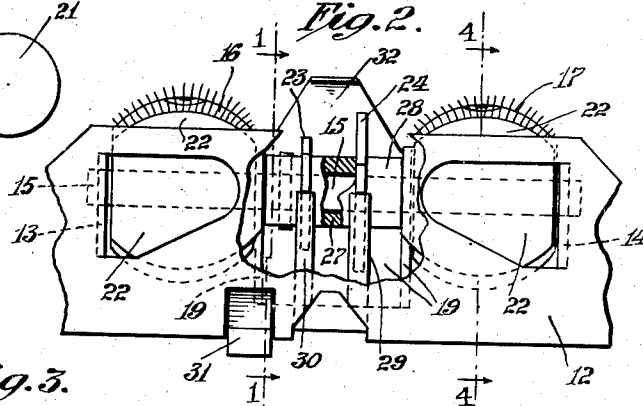
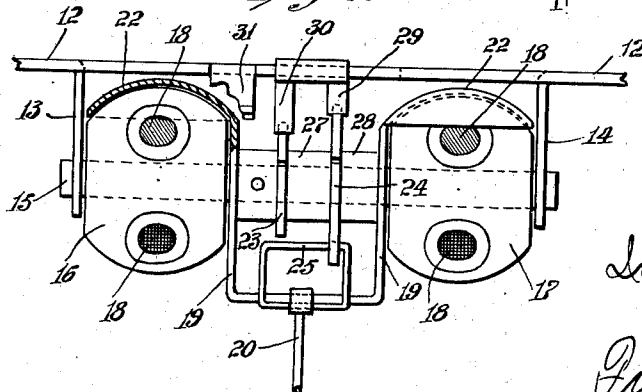


Fig. 3.



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UNITED STATES PATENT OFFICE

2,475,508

DOLL'S HEAD

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Application February 8, 1944, Serial No. 521,493

8 Claims. (Cl. 46-169)

1

The invention relates to dolls' heads and more particularly to the eye structure of such heads.

Heretofore it has been a common practice to provide dolls' heads with an eye structure in which the eyeballs are mounted upon a bar rotatably mounted in a frame secured within the head and had areas simulating eyelids upon the eyeballs. Pendulous means were provided for rotating said eye bar when changing the upright position of a doll to a recumbent position, or vice versa, so that the simulated iris and pupil were exposed when a doll was upright and the simulated lid was exposed when the doll was recumbent. In another eye structure, the simulated eyeballs had no rotative movement and eyelids mounted upon an oscillatory frame were moved by a pendulous weight into or out of position in front of the eyeball according to whether the doll was in a recumbent or an upright position.

It has been proposed to provide dolls in which a plurality of pairs of eyes having different characteristics are carried by a manually movable member so that a child may at will bring different eyes into the eye openings. In such a construction the movement of a doll from one position to another has no controlling effect upon the eyes to be exposed through said openings.

With the above conditions in mind, I have produced a doll's head in which the eye structure is so constructed that a sequence of eyes having different forms or differently colored irises will be successively exposed through the eye openings of the head as a result of the movement of the doll from a recumbent to an upright position. The mechanisms for encompassing such changes in the eye effect are all concealed within the head, so that the results will seem mysterious to a child and arouse much additional interest in the doll. To increase the mystification, the eye structure is such as to cause the action to be entirely automatic, and preferably is such as to cause actuation of the eyeballs at intervals requiring a repeated change of posture of the doll, thus further increasing a child's mystification.

Since rotative movement of the eyes occurs only upon certain predetermined number of successive movements of the doll, and the eyes must be concealed when such movement occurs, I provide simulated eyelids actuated with each change of posture of the doll, so that when movement is imparted to the eyes, such movement is concealed by or so synchronized with that of the eyes as to distract attention therefrom.

The construction is such as to permit the movement of the eyes and of the eyelids by the same

2

actuating mechanism, and the manner of forming and combining the various parts of this mechanism are such as to preclude possible interference with that continued operation of the mechanism necessary to secure the desired action.

The invention consists primarily in the combination with a doll's head having eye openings therein, of an eye structure embodying therein a rotatable shaft, two drumlike members carried thereby and movable therewith, each adjacent an eye opening and each having a plurality of dissimilar decorations simulating the iris of an eye, at spaced intervals about its periphery, means whereby said members carried by said shaft may be simultaneously turned to bring said decorations successively within eye openings, a pendulous weight actuated with each movement of a doll between an upright and a recumbent position, means acted upon by said weight, adapted to engage the means carried by said shaft, and means adapted to hold said last named means disengaged from the means carried by said shaft but permit it to engage therewith after a plurality of succeeding movements of said weight to intermittently actuate said shaft; and in such other novel features of construction and combination of parts as are hereinafter set forth and described and more particularly pointed out in the claims hereto appended.

Referring to the drawings,

Fig. 1 is a vertical section through the upper part of a doll's head equipped with an eye structure embodying the invention and shown upon the line 1-1 of Fig. 2;

Fig. 2 is a plan view of the eye structure shown in Fig. 1 with portions of the main frame broken away;

Fig. 3 is a rear view thereof, and

Fig. 4 is a section on the line 4-4 of Fig. 2 with a drum-like member bearing the iris decorations shown in elevation.

Like numerals refer to like parts throughout the several views.

In the embodiment of the invention shown in the drawings, an ordinary molded pulp doll's head is indicated at 10. This head has the usual spaced eye openings 11 located at opposite sides of the nose.

Secured within the head in any desired or well known manner, is a metal main frame or bridge, 12 having spaced bearing brackets 13-14 one adjacent the outside of each eye opening. Mounted in said brackets is a rotatable eye bar 15 upon which are two drumlike members 16-17 each transversely arched so as to give the effect of an

eyeball to each portion of each member exposed through an eye opening. Each of said members is secured to and rotatable with the eye bar 15 so as to ensure simultaneous, similar movement to both members. Upon each member 16—17 is a sequence of equally spaced decorations simulating the iris, pupil and white of an eye, and located as best shown in Figs. 2 and 3 of the drawings. It is apparent that by intermittently turning said eye bar 15 a part of a revolution corresponding with the spacing of the centers of said decorations 18, said simulated eyes may be successively exposed through the eye openings 11 and that by using different coloring in or a different form of and location of the irises of each pair of eyes, different effects can be secured in the appearance of the doll with the turning of said eye bar 15.

The actuating mechanism for the eye members 16—17 includes an oscillatory pendulum frame 19 idly mounted on the eye bar 15, secured to which is a stem 20 carrying a weight 21 sufficient to develop power for turning said shaft against the resistance of a spring actuating and spring detent pawls included in said mechanism, through gearing to be hereinafter described.

Carried by and movable with the frame 19 are plates 22 simulating eyelids having the usual eyelashes. These eyelid plates are located, and freely movable, in a space afforded between the members 16—17 and the respective eye openings 11 and will, with changes of posture of a doll, have one full oscillation or closing and opening movement with each full oscillation of the frame 19 by the weight 21.

Secured to the eye bar 15 so as to impart movement thereto, is a ratchet wheel 23 and idly mounted upon said shaft is a ratchet wheel 24. Co-operating with both ratchet wheels is a spring actuating ratchet pawl 25 carried by the pendulum frame 19 (see Fig. 3). Both ratchet wheels 23 and 24 have the same number of teeth but the wheel 24 is larger in diameter than the wheel 23 so that the ratchet pawl 25 is disengaged from the wheel 23 excepting when it is desired to transfer movement of the wheel 24 to the eye bar 15. This transfer is effected by providing the wheel 24 with one deep tooth 26 permitting the ratchet pawl 25 to engage the ratchet wheel 23 once during each full rotation the wheel 24. This is an old and well known form of transfer mechanism.

There being five simulated eyes 18 on each of the members 16—17, the ratchet wheels 23—24 will each have five ratchet teeth spaced apart the same number of degrees in arc to correspond with the spacing of the eye simulations upon said members. Variation in the number and spacing of eye simulations would require a corresponding variation in the number and spacing of the teeth upon the wheels 23—24. With the arrangement shown, the eye bar 15 will be actuated following each fifth change of posture of a doll.

Suitable spacing washers 27—28 are used upon the shaft 15 on opposite sides of the ratchet wheel 24.

Acting upon the ratchet wheel 23 is a spring detent pawl 30 and acting upon the wheel 24 is a similar detent pawl 29, both said pawls being secured to the main frame 12.

The actuating ratchet pawl 25 is, as shown, in the form of a looped spring secured to the pendulum frame 19.

Projecting from the main frame 12 is a bumper plate 31 engageable with the pendulum frame.

19 when a doll is in the recumbent position and projecting from the forward edge of the pendulum frame 19 is a bumper 32 engageable with the forward part of the doll's head. The bumper plate 31 is so positioned as to permit movement of the frame 19 in excess of that required to impart a step by step movement to the ratchet wheel 24 thus compensating for variance in the lengths of the teeth upon that ratchet wheel and upon the ratchet wheel 23.

If a materially greater number of movements of the pendulum is required before movement is to be imparted to the shaft 15, the transfer mechanism may be modified to delay the engagement of the ratchet pawl with the ratchet wheel 23, which is also old and well known as a mechanical movement.

The operation of the eye structure above described and shown in the drawings, is substantially as follows:

When a doll's head is in an upright position as shown in Fig. 1, the eyelids are positioned above the members 16—17 so as to expose one of the eye simulations 18 upon each member through an eye opening 11. While in an upright or recumbent position, the shaft 15 is held against movement by the detent pawl 30 acting upon the ratchet wheel 23 secured to said shaft, and the ratchet wheel 24 is held against movement in relation to the ratchet wheel 23 by the detent pawl 29.

If the position of the doll's head be changed by placing the doll in a reclining or recumbent position, the pendulum frame turns in relation to the shaft 15, the weight 21 rocking the frame 19 in a manner to impart turning movement to the ratchet wheel 24 by the spring ratchet pawl 25, without, however, imparting movement to the shaft 15.

Simultaneously with this movement of the pendulum frame 19 by the weight 21, said frame moves the eyelid plates 22 across the eye openings 11 to simulate the closing of the eyes of the doll. It will be noted that this eyelid plate movement is independent of any movement of the members 16—17.

As the doll's head is restored to the upright position, there is a reverse movement of the frame 19 and the eyelid plates 22. During this movement, the spring pawl 25 rides over the teeth of the ratchet wheel 24 which latter is held against movement by a positive locking engagement of the detent pawl 29 with a tooth upon said wheel. Hence step by step movements are imparted to the ratchet wheel 24 with succeeding changes of position of a doll and the resulting oscillations of the frame 19.

During some of the oscillations of the frame 19, the pawl 25 is held by the ratchet wheel 24 out of engagement with the ratchet wheel 23, but when the ratchet wheel 24 has had a sufficient number of impulses to bring the deep tooth 26 into a position where it is engageable by the pawl 25, said pawl will have a reflex action causing it to enter this deep tooth and engage a tooth upon the ratchet wheel 23. The next oscillation of the frame 19 will thereupon impart a partial rotation to both ratchet wheels 23 and 24, to the shaft 15 and to the drumlike eye members 16—17, thus moving one pair of eye simulations away from eye openings 11 and bringing the succeeding pair to a position to be exposed through said openings.

By changing or varying the color and design of

the several eye simulations '18, surprising changes may be wrought in the appearance of a doll.

As heretofore stated, with five teeth on each ratchet wheel 23—24, the eye members will receive an impulse after five actuations of the ratchet wheel 24, but if a more infrequent actuation of the shaft 15 is desired, the use of a ratchet wheel or wheels intermediate the wheels 23—24 may be resorted to, a practice common with transfer mechanisms of the type shown, or the number of teeth on the wheels 23—24 may be increased.

The weight 24 must be sufficiently heavy to overcome the resistance to flexure of the actuating pawl when riding over a tooth of the wheel 24 as well as to the resistance of the detent pawls during the turning of either or both wheels 23—24 as well as to act as a counterpoise for the eyelid plates 22 and their support.

It is not my intention to limit the invention to the details of construction shown in the drawings, it being apparent that such may be varied without departing from the spirit and scope of the invention.

It is essential, however, that the simulated eye carrying members be automatically and intermittently actuated with successive changes of a doll from an upright to a recumbent position to bring succeeding eye simulations to eye openings in a doll's head.

Having described the invention, what I claim as new and desire to have protected by Letters Patent is:

1. In dolls' heads, the combination with a head having eye openings therein of an eye structure embodying therein a rotatable shaft, two drum-like members carried thereby and movable therewith, each adjacent an eye opening and each having a plurality of decorations simulating the iris of an eye, said decorations being at spaced intervals on said members, eyelid plates movable between said members and the eye openings, means carrying said plates idly mounted on said shaft, means whereby said members may be simultaneously turned to bring said decorations successively within eye openings including a pendulous weight actuated with each movement of the doll between an upright and a recumbent position, and means acted upon by said weight, and connected to said members for intermittently actuating said members, and connections between said weight and the means carrying said eyelid plates whereby said plates are actuated with each oscillation of said weight independently of movement of said members.

2. In dolls' heads, the combination with a head having eye openings therein of an eye structure embodying therein a rotatable shaft, two drum-like, transversely arched members carried thereby and movable therewith each adjacent an eye opening and each having a plurality of dissimilar decorations simulating the iris of an eye, said decorations being at spaced intervals about said members, a ratchet wheel carried by said shaft whereby said members may be simultaneously turned to bring said decorations successively within eye openings, another ratchet wheel of greater diameter than the ratchet wheel upon said shaft, idly mounted upon said shaft, an intermittently operative transfer mechanism including a ratchet pawl constantly engaging said larger ratchet wheel and adapted to engage said ratchet wheel carried by said shaft during intermittent actuations of said transfer mechanism whereby said shaft will receive only inter-

mittent impulses and a pendulous weight actuated with each movement of the doll between an upright and a recumbent position.

3. In dolls' heads, the combination with a head having eye openings therein of an eye structure embodying therein a rotatable shaft, two drum-like, transversely arched members carried thereby and movable therewith, each adjacent an eye opening and each having a plurality of dissimilar decorations simulating the iris of an eye, said decorations being at spaced intervals about said members, eyelid plates movable between said members and the eye openings, means carrying said plates idly mounted on said shaft, a ratchet wheel carried by said shaft whereby said members may be simultaneously turned to bring said decorations successively within eye openings, another ratchet wheel of greater diameter than the ratchet wheel upon said shaft, idly mounted upon said shaft, an intermittently operative transfer mechanism including a ratchet pawl constantly engaging said larger ratchet wheel and adapted to engage said ratchet wheel carried by said shaft during intermittent actuations of said transfer mechanism whereby said shaft will receive only intermittent impulses, a pendulous weight actuated with each movement of the doll between an upright and a recumbent position, and connections between said weight and the means carrying said plates whereby said plates are actuated with each oscillation of said weight independently of movement of said members.

4. In dolls' heads, the combination with a head having eye openings therein of an eye structure embodying therein a rotatable shaft, two drum-like, transversely arched members carried thereby and movable therewith, each adjacent an eye opening and each having a plurality of dissimilar decorations simulating the iris of an eye, said decorations being at spaced intervals about said members, a ratchet wheel carried by said shaft whereby said members may be simultaneously turned to bring said decorations successively within eye openings, another ratchet wheel of greater diameter than the ratchet wheel upon said shaft having the same number of teeth as said ratchet wheel carried by said shaft, one of said teeth being of a depth greater than the others, a spring ratchet pawl constantly engaging said larger ratchet and adapted to enter said deep tooth and engage said ratchet wheel carried by said shaft whereby said shaft will receive only intermittent impulses, said larger ratchet wheel being idly mounted on said shaft, and a pendulous weight operative upon said pawl and actuated with each movement of the doll between an upright and a recumbent position.

5. In dolls' heads, the combination with a head having eye openings therein of an eye structure embodying therein a rotatable shaft, two drum-like, transversely arched members carried thereby and movable therewith, each adjacent an eye opening and each having a plurality of dissimilar decorations simulating the iris of an eye, said decorations being at spaced intervals about said members, eyelid plates movable between said members and the eye openings, means carrying said plates idly mounted on said shaft, a ratchet wheel carried by said shaft whereby said members may be simultaneously turned to bring said decorations successively within eye openings, another ratchet wheel of greater diameter than the ratchet wheel upon said shaft having the same number of teeth as said ratchet wheel carried by

said shaft, one of said teeth being of greater depth than the others, a spring ratchet pawl constantly engaging said larger ratchet wheel and adapted to enter said deep tooth and engage said ratchet wheel carried by said shaft whereby said shaft will receive only intermittent impulses, said larger ratchet wheel being idly mounted on said shaft, a pendulous weight operative upon said pawl and actuated with each movement of the doll between an upright and a recumbent position, and connections between said weight and the means carrying said eyelid plates whereby said plates are actuated with each oscillation of said weight independently of movement of said members.

6. In dolls' heads, the combination with a head having eye openings therein of an eye structure embodying therein a rotatable shaft, two drum-like, transversely arched members carried thereby and movable therewith, each adjacent an eye opening and each having a plurality of dissimilar decorations simulating the iris of an eye, said decorations being at spaced intervals about said members, a ratchet wheel carried by said shaft whereby said members may be simultaneously turned to bring said decorations successively within eye openings, another ratchet wheel of greater diameter than the ratchet wheel upon said shaft having the same number of teeth as said ratchet wheel carried by said shaft, one of said teeth being of a depth greater than the others, a spring ratchet pawl constantly engaging said larger ratchet and adapted to enter said deep tooth and engage said ratchet wheel carried by said shaft whereby said shaft will receive only intermittent impulses, said larger ratchet wheel being idly mounted on said shaft, a pendulous weight operative upon said pawl and actuated with each movement of the doll between an upright and a recumbent position, and means co-operating with said ratchet wheels preventing turning thereof with movement of said weight in one direction while permitting a controlled turning thereof with movement of said weight in the opposite direction.

7. In dolls' heads, the combination with a head having eye openings therein of two rotatable members each having on same a plurality of spaced dissimilar decorations simulating eyes a shaft carrying said members and rotatable therewith and a mechanism automatically operative with each change of posture of the doll including therein means carried by said shaft capable of imparting a rotative impulse to said members, and means whereby it is made inoperative to impart an impulse to said members except following a plurality of actuations of said mechanism.

8. In dolls' heads, the combination with a head having eye openings therein of two rotatable drum-like members each having on same a plurality of spaced, dissimilar decorations simulating eyes, plates simulating eyelids carried by an oscillatory frame so as to be movable into and out of position between said members and said eye openings, and a mechanism automatically operative with each change of posture of the doll, to oscillate said eyelid frame, and including therein means whereby said mechanism is made operative to impart rotative impulses to said members only during intermittent actuations of said mechanism.

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