

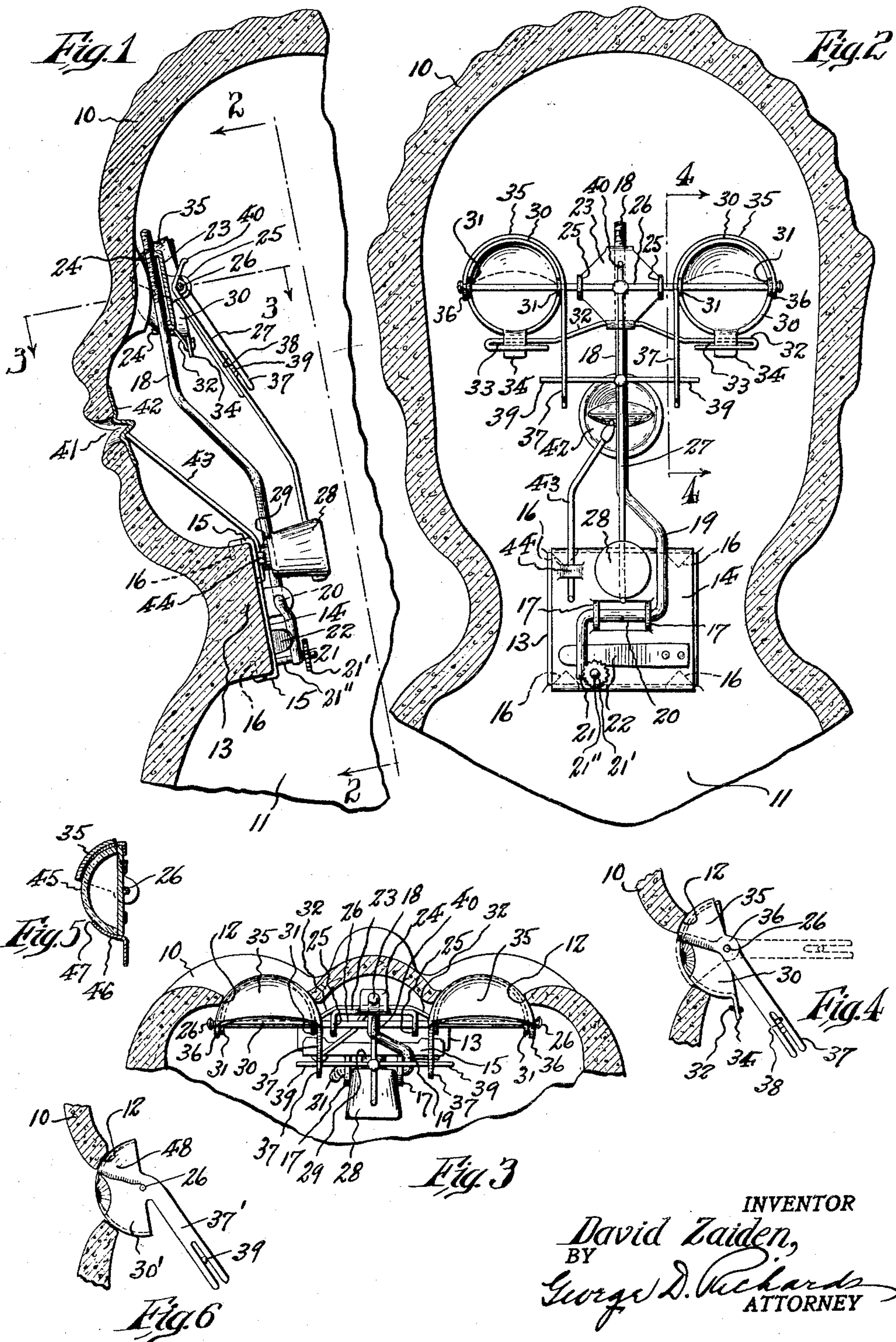
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EYE STRUCTURE FOR DOLLS

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## UNITED STATES PATENT OFFICE

DAVID ZAIDEN, OF BROOKLYN, NEW YORK, ASSIGNOR OF ONE-FOURTH TO ISAAC KAUFMAN AND ONE-FOURTH TO SAMUEL KAUFMAN, BOTH OF FOREST HILLS, NEW YORK, AND ONE-FOURTH TO JACOB KAUFMAN, OF BROOKLYN, NEW YORK

## EYE STRUCTURE FOR DOLLS

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This invention relates to improvements in movable eye elements for doll heads, and to a novel supporting structure therefor capable of being inserted through the neck of a doll head and thereupon easily secured in place so that the eye elements will be operatively related to the eye socket openings in the doll head wall.

This invention has for its principal object to provide a novel upright support for eye elements which will resiliently press the latter toward and into operative relation to the eye socket openings of a doll head; means being further provided in connection with the support whereby the eye elements are capable of self-adjusting movements both transversely toward and from each other as well as about the axis of the main upright support, so that each eye element will individually and accurately fit itself to the particular eye socket opening to which it is opposed when the support is inserted within the head and secured in place therein.

This invention has for a further object to provide a novel form and arrangement of yieldable supporting structure for optionally carrying eye-ball members having movable lids or movable eye-ball members having fixed lids formed or depicted thereon, together with a pivoted gravity pendulum for actuating the one or the other, as the case may be, when the doll is moved from upright to down-lying position or vice versa.

This invention has for a further object to provide a novel form of supporting means for movable eye elements, together with anchoring means for said supporting means capable of easy and quick attachment to a conveniently accessible point upon the doll head wall within and adjacent to the bottom or neck opening of the latter; said anchoring means also providing means when required to carry and hold in place a teeth and tongue plate in proper relation to a mouth aperture of the doll head.

Other objects of this invention, not at this time more particularly enumerated, will be understood from the following detailed description of the same.

An illustrative embodiment of this inven-

tion is shown in the accompanying drawing, in which:—

Fig. 1 is a vertical sectional view of a doll-head equipped with the novel eye structure according to this invention; Fig. 2 is a transverse sectional view, on line 2—2 in Fig. 1; Fig. 3 is a horizontal sectional view, on line 3—3 in Fig. 1; Fig. 4 is a fragmentary sectional view, on line 4—4 in Fig. 2; Fig. 5 is a sectional view of a modified form of eye-ball element; and Fig. 6 is a view showing a form of movable eye-ball having an eye-lid formed or depicted thereon.

Similar characters of reference are employed in the above described views, to indicate corresponding parts.

Referring to the drawing, the reference character 10 indicates a doll-head of the usual hollow construction having a bottom opening 11 in its neck portion. The doll-head may be made of any suitable material, such, for example, as a molded plastic material which becomes rigid when hardened. Formed in said doll-head 10 are the usual eye-socket openings bounded by inwardly presented marginal concave seats 12. Also in molding the doll-head it is preferable to provide within the neck portion thereof, and downwardly spaced below the level of the eye-sockets, an integral interiorly and rearwardly projecting square boss 13, as shown in Figs. 1 and 2.

The novel eye structure, according to this invention, comprises an anchor plate 14 having marginal lips 15 whereby said plate 14 may be disposed in overlying relation to the face of said boss 13, with the lips 15 engaging over opposite margins of the latter. Said lips 15 are provided with sharp prongs 16 which may be turned into the body of said boss 13 to grip the same, and thus rigidly secure the anchor plate to the boss. While the fastening prongs 16 provide a convenient, cheap and easily manipulated means for fastening the anchor plate 14 to the boss 13, I do not necessarily limit myself to the use thereof since, the anchor plate may be otherwise secured within the doll-head, and either in connection with the boss 13 or otherwise in other forms of heads.

Connected with said anchor-plate 14 are a



pair of laterally spaced transversely aligned perforate bearing elements or ears 17, the same being preferably struck out of the body of said anchor plate.

5 The reference character 18 indicates an upright supporting rod, having an off-setting bend 19 at its lower portion terminating in a transversely extending journal portion 20  
10 to extend through said bearing elements or ears 17, thus pivotally connecting said upright supporting rod to said anchor plate 14. Extending downwardly from the opposite end of said journal portion 20, and preferably integral therewith, is a lever arm  
15 21. Securely fixed by one end, constituting its base, to the anchor plate 14 is a transversely extending leaf spring 22, the free end of which underlies and yieldably thrusts against said lever arm 21, whereby the up-  
20 right supporting rod is yieldably thrust or swung toward the face-portion of the doll-head. Other forms of spring or tension exerting means to accomplish this purpose may be employed if desired. Said upright  
25 supporting rod extends upwardly through the doll-head interior in an approximately central line between the eye socket openings thereof.

30 Axially adjustable on said upright supporting rod 18 is a carrier plate 23, the same having forwardly projecting vertically aligned perforate ears 24 at one side thereof through which said upright supporting rod 18 extends. The adjustable connection be-  
35 tween said rod and carrier plate is preferably obtained by a screw-threaded engagement of the upper free end portion of the rod in one of said ears 24, although it will be obvious that any other convenient or suitable means  
40 may be provided for holding said carrier plate at desired vertically adjusted level upon said rod. The purpose of this adjustment is to establish the level of eye elements supported from said carrier plate so as to cor-  
45 rectly oppose said eye elements to the eye opening sockets of the doll-head, as will more at length subsequently appear. Said carrier plate is further provided with rearwardly projecting transversely aligned perforate  
50 bearing ears 25.

60 Journalled in said bearing ears 25 of said carrier plate 23 is a transverse carrier-shaft 26. Suitably secured to said carrier-shaft 26, preferably at a central point intermediate said bearing ears 25,  
55 is a depending pendulum arm 27 on the lower free end portion of which is suitably fixed a pendulum weight 28. Said pendulum weight is positioned to swing within the bend 19 of the upright supporting rod 18 so as to be normally arrested by abutment against the upper end portion of said anchor plate 14, when the doll-head occupies normal up-  
65 right position, said pendulum arm 27 having rearwardly off-setting inclination to per-

mit of such disposition and action of the pendulum weight. In order to render noiseless the striking of said anchor plate by said pendulum weight, the latter is provided with a buffer-member 29 of some suitable resilient material, such e. g. as cork, felt, rubber or the like.

70 In the form shown in Figs. 1 to 5 of the drawings, the eye elements comprise eye-balls held against rotative movement cooperative with which are arranged rotative eye-  
75 lid members. The eye-balls comprise semi-spherical bodies or shells 30, the outer convex surfaces of which have suitably applied thereto representations of the pupils and iris of an eye. Said shells 30 are provided with transversely aligned perforate ears 31 to receive the carrier-shaft 26, whereby an eye-ball shell 30 is loosely mounted on the re-  
80 spective opposite end portions of said carrier-shaft, so that although the carrier-shaft supports the eye-ball shells the former is free to turn relative to the latter, and the eye-ball shells may be adjustably shifted along the carrier-shaft in either direction to space the  
85 same apart in correspondence with the spacing of the eye-socket openings of the doll-head in which they are mounted. In order to hold the eye-ball shells against rotation with the carrier-shaft, oppositely extending  
90 retaining arms 32 are connected with said carrier plate 23 to respectively extend adjacent to and preferably beneath the respective eye-ball shells. The free end portions of said retaining arms 32 are provided with slots  
95 or loops 33, preferably formed by doubling back said end portions upon themselves. Projecting from the periphery of each eye-ball shell is a tongue or lug 34 which engages in the slot or loop 33 of the adjacent retain-  
100 ing arm 32, thus holding the eye-ball shells against rotative movement about the carrier-shaft, while nevertheless permitting adjusting shifting movements of the former upon  
105 and along the latter.

110 The reference character 35 indicates movable segmental eye-lid members which overlie the exterior surfaces of the eye-ball shells 30, the same having perforate fulcrum ears 36 at their ends whereby they are pivotally  
115 mounted upon said carrier-shaft 26. Integrally connected with and depending from the inner side of each eye-lid member 35 is an actuating arm 37 having a slotted free end portion, as at 38. Secured to said pen-  
120 dulum arm 27 is a cross-arm 39, the oppositely extending free end portions of which respectively engage said actuating arms 37 by projection through the slotted end portions  
125 thereof.

130 When the doll-head is held in substantially upright position so that the pendulum 27—28 is in normal position, as stopped against the anchor plate 14, the eye lid members 35 occupy upraised or upturned posi-



tions relative to the eye ball shells 30. When the doll-head is tipped backward from substantially upright position, said pendulum 27—28 will swing rearwardly whereby the cross-arms 39 will, by their engagement with the slotted ends 38 of said actuating arms 37, cause the actuating arms 37 to also swing rearwardly, thus turning the eye-lid members 35 on the carrier-shaft 26 as a fulcrum, whereby said eye-lid members 35 will move downwardly over the eye ball shells 30 and across the eye socket openings of the doll-head thus simulating, in a very life-like manner, the closing of the doll-eyes. The upper end of said pendulum arm 27 is provided with an angular stop extension or finger 40 which, as the pendulum arm swings rearwardly, will swing forwardly into engagement with the rear side of the carrier plate 23, thus limiting the rearward swing of the pendulum 27—28 to an amount of movement which is only sufficient to complete the closing movement of the eye-lid members 35.

Since the upright supporting rod 18 is yieldably urged by the spring 22, coacting with its lever arm 21, to a forwardly swung position, the eye elements supported by the same will be constantly thrust into seated relation to the eye socket openings 12 of the doll-head, and due to the ability of the carrier plate 23 and the carrier shaft 26 supported thereby, to turn in either direction about the vertical axis of the supporting rod, each individual eye element set will automatically engage the eye-socket opening to which it is opposed, notwithstanding any inequalities in location or form of said eye-socket openings. Furthermore, the universal self-compensating movements of which each eye element set is individually capable, not only assures initial correctly associated relation of the eye element sets with the eye-socket openings, but also assures maintenance of such correct association, by reason of the self-compensating nature of the support thereof, even in the event of warping, expansion or contraction or like changing effects to which the doll-head may be subjected, and which effects might otherwise tend to disturb the nicely fitted relation of these parts. In order to prevent undue friction of the eye elements relative to the eye sockets, the inward thrust of the rod 18 may be limited by engagement of the spring pressed lever arm 21 with an adjustable stop nut 21' which is mounted on the threaded post 21''.

In doll-heads having mouth apertures, as at 41 (see Fig. 1), with which a teeth and tongue plate, as 42, is usually associated, the anchor-plate 14 may be provided if desired, with a suitable retaining support for the plate 42 in the form of a wire arm or rod 43. The lower end of this arm or rod 43 is suitably fixed to the anchor plate 14 as by the anchor loop 44 pressed outwardly from the

latter or in any other suitable manner; while the upper end of the arm or rod 43 is soldered or otherwise secured to the back of the plate 42 in supporting relation thereto, and so as to hold the latter in properly registered and associated relation to the mouth aperture 41 of the doll-head.

While I have shown in Figs. 1 to 4 inclusive the eye-element sets having an eye-ball shell 30 provided with a suitable representation of a pupil and iris depicted upon its outer convex surface, other arrangements are possible. For example, a glass-eye body 45 may be provided, the same being mounted within a holding shell 46 having an opening 47 to expose the glass-eye body to view. In such case the shell is mounted in connection with the carrier shaft 26 and the retaining arms 32 in the same manner as above described in connection with the eye-ball shell 30, and the movable eye-lid member 35 is pivoted for movement across the shell 46 and its opening 47 also in the manner as above described (see Fig. 5).

An eye element set of less expensive form may be provided as shown in Fig. 6, in which form an eye-ball shell 30' is rotatably mounted on the carrier shaft 26, and provided with a slotted actuating arm 37' to be operatively engaged by the cross-arm 39 of the pendulum 27—28. The outer surface of the eye-ball shell 30' is provided, in addition to the representation of the pupil and iris of an eye, with a representation of an eye-lid, indicated at 48 and disposed over the upper portion of the eye-ball shell 30'. In this arrangement, the independent movable eye-lid member is eliminated, and the turning of the eye-ball shell 30' relative to the eye-socket opening of the doll-head will operate to move the lid portion thereof across the eye-socket opening with eye closing effect. In other respects, the means for adjustably and yieldably supporting eye element sets of this type is the same as described above.

From the above description it will be obvious that this invention provides an eye-set for doll heads comprising a unitary structure which may be completely assembled outside of the doll-head, and then inserted upwardly through the neck opening of the latter, so as to be quickly and easily assembled in operative relation to the doll-head and to the eye-socket openings thereof; and, furthermore, when so assembled, the eye elements of the same will be yieldably and compensatingly maintained in proper working relation to the eye-socket openings of the doll-head.

As many changes could be made in the above described constructions, and many apparently different embodiments of the invention could be made without departing from the scope thereof, it is intended that all matter contained in the above description or shown in the accompanying drawing shall be



interpreted as illustrative and not in a limiting sense.

I claim:—

1. An eye structure for dolls, comprising a  
5 pivoted upright support, a carrier plate vertically adjustable on the free end portion of said support and also capable of lateral turning movement thereon, a transverse carrier shaft mounted on said plate, eye elements adjustably shiftable on the oppositely extending end portions of said carrier shaft, a pendulum means connected with said carrier shaft, means operated by said pendulum means for actuating movable parts of eye elements, and  
10 spring means to turn said upright support on its fulcrum to yieldably urge said eye elements into seated engagement with eye-socket openings of a doll-head.

2. An eye structure for dolls, comprising  
20 an anchor plate to be fixedly secured within the neck portion of a doll-head, an upright support pivotally mounted on said anchor plate to extend upwardly therefrom into the interior of said doll-head intermediate eye-socket openings of the latter, a carrier plate vertically adjustable and rotatable on the free end portion of said support, a transverse carrier shaft mounted on said carrier plate, eye elements adjustably shiftable on oppositely  
25 extending end portions of said carrier shaft, a pendulum means connected with said carrier shaft, means operated by said pendulum means for actuating movable parts of said eye elements, and spring means to turn said  
30 support on its fulcrum to yieldingly urge said eye-elements into seated engagement with the eye-socket openings of said doll-head.

3. An eye structure for dolls, comprising  
40 a pivoted upright support, a carrier plate vertically adjustable on the free end portion of said support, a transverse carrier shaft mounted on said plate, eye-ball members adjustably shiftable on the oppositely extending end portions of said carrier shaft, retaining arms oppositely extending from said carrier plate, said eye-ball members and retaining arms having interengageable means to hold the former against rotation on said carrier shaft, movable eye-lid members pivoted  
45 on said carrier shaft and oscillatably movable over said eye-ball members, a pendulum means connected with said carrier shaft, means interengaging said eye-lid members with said pendulum means whereby the former are actuated by the latter, and spring means to turn said upright support on its fulcrum to yieldably urge said eye-ball and eye-lid members into seated engagement with eye-socket openings of a doll-head.

4. An eye structure for dolls, comprising  
60 an anchor plate to be fixedly secured within the neck-portion of a doll-head, an upright support pivotally mounted on said anchor plate to extend upwardly therefrom into the interior of said doll-head intermediate eye-

socket openings of the latter, a carrier plate vertically adjustable on the free end portion of said support, a transverse carrier shaft mounted on said carrier plate, eye-ball members adjustably shiftable on the oppositely  
70 extending end portions of said carrier shaft, retaining arms oppositely extending from said carrier plate, said eye-ball members and retaining arms having interengageable means to hold the former against rotation on said carrier shaft, movable eye-lid members pivoted on said carrier shaft and oscillatably movable over said eye-ball members, a pendulum means connected with said carrier shaft, means interengaging said eye-lid members with said pendulum means whereby the former are actuated by the latter, and spring means to turn said upright support on its fulcrum to yieldably urge said eye-ball and eye-lid members into seated engagement with eye-socket openings of the doll-head.

5. An eye structure for dolls, comprising a pivoted upright support having means to mount the same within a doll-head for upward extension therein intermediate eye-socket openings thereof and for swinging movement toward and from the front of said head in which said eye-socket openings are located, a carrier means mounted on said support and turnable in horizontal plane about the vertical axis of said upright support, eye-elements transversely adjustable on said carrier means, a pendulum means suspended by said carrier means, said eye elements having movable portions subject to actuation by said pendulum means, and spring means to swing said upright support on its fulcrum to yieldably urge said eye-elements into seated engagement with said eye-socket openings of the doll-head.

6. An eye structure for dolls, comprising an upright support, a carrier plate mounted on said support and turnable in horizontal plane about the vertical axis of said support, a transverse carrier shaft mounted on said carrier plate with its ends oppositely extending therefrom, eye-elements adjustably shiftable on the oppositely extending end portions of said carrier shaft, and a pendulum means suspended from said carrier shaft and having means to actuate movable parts of said eye-elements.

7. An eye structure for dolls, comprising an upright support, a carrier plate turnable on said support, a transverse carrier shaft mounted on said carrier plate with its ends oppositely extending therefrom, eye-ball members adjustably shiftable on the oppositely extending end portions of said carrier shaft, retaining arms oppositely extending from said carrier plate, said eye-ball members and retaining arms having interengageable means to hold the former against rotation on said carrier shaft, movable eye-lid members pivoted on said carrier shaft and  
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oscillatably movable over said eye-ball members, a pendulum means suspended from said carrier shaft, each movable lid member having a slotted lever arm, and said pendulum  
5 means having a cross bar with its respective end portions operatively engaged with said slotted lever arms of said eye-lid members.

8. An eye structure for dolls, comprising an upright support, a carrier plate turnable  
10 on said support, a transverse carrier shaft mounted on said carrier plate with its ends oppositely extending therefrom, eye-ball members adjustably shiftable on the oppositely extending end portions of said carrier shaft, retaining arms oppositely extending  
15 from said carrier plate, said eye-ball members and retaining arms having interengageable means to hold the former against rotation on said carrier shaft, movable eye-lid members pivoted on said carrier shaft and  
20 oscillatably movable over said eye-ball members, a pendulum means suspended from said carrier shaft, each movable lid member having a slotted lever arm, said pendulum means  
25 having a cross bar with its respective end portions operatively engaged with said slotted lever arms of said eye-lid members, and means to resiliently urge said upright support, when mounted within a doll-head, in  
30 the direction of the eye-socket openings of said head to thereby maintain said eye-ball and eye-lid members in operative relation to said eye-socket openings.

In testimony, that I claim the invention set  
35 forth above I have hereunto set my hand this 13th day of January 1932.

DAVID ZAIDEN.

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