United States Patent

Penrod et al.

[15] **3,684,292**

[45] **Aug. 15, 1972**

[54] **PUZZLE TOY**

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[22] Filed: **Dec. 3, 1970**

[21] Appl. No.: **94,820**

[52] **U.S. Cl.** **273/156,** 70/289, 70/413

[51] **Int. Cl.**.....**A63f 9/08**

[58] **Field of Search** ..273/156; 206/1.5; 70/289, 290, 70/413

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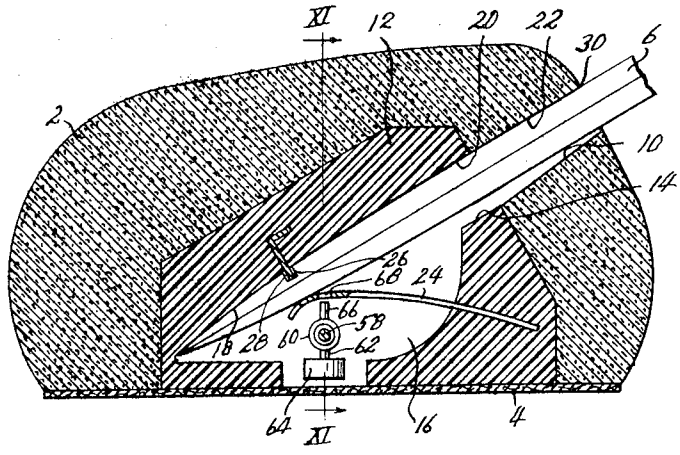
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[57] **ABSTRACT**

A puzzle toy consisting of a body member, a rod-like member adapted to be inserted into an aperture of said body member, and a locking mechanism operable to engage and secure said rod in said body member, said locking mechanism being releasable by a predetermined but secret relative movement of said body member and said rod to permit withdrawal of said rod, with or without additional mechanism further preventing release of said locking mechanism or withdrawal of said rod, said further mechanism being operable by predetermined movements or positioning of the body member itself, or by positioning a magnet adjacent the exterior of said body member.

11 Claims, 11 Drawing Figures



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SHEET 1 OF 2

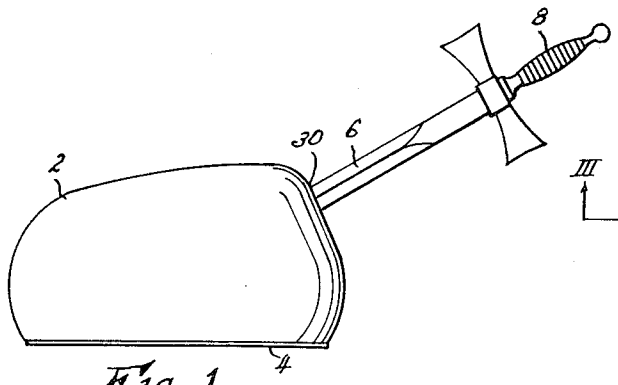


Fig. 1

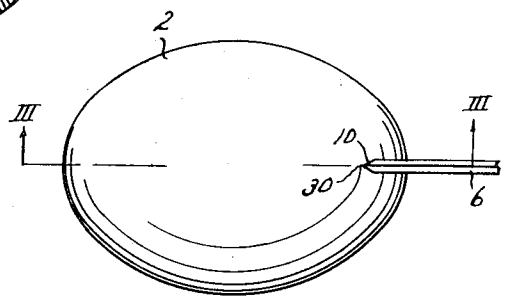


Fig. 2

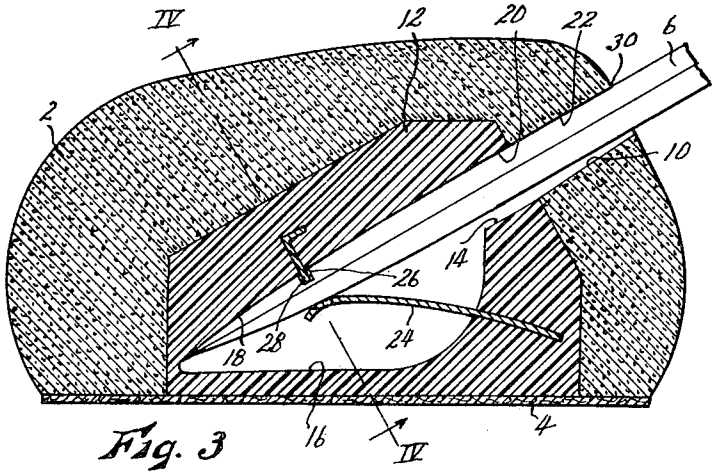


Fig. 3

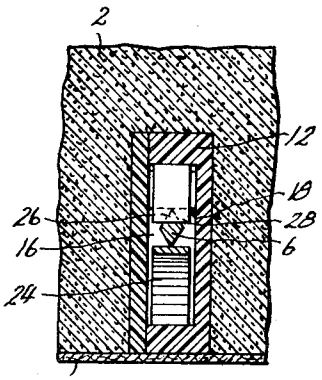


Fig. 4

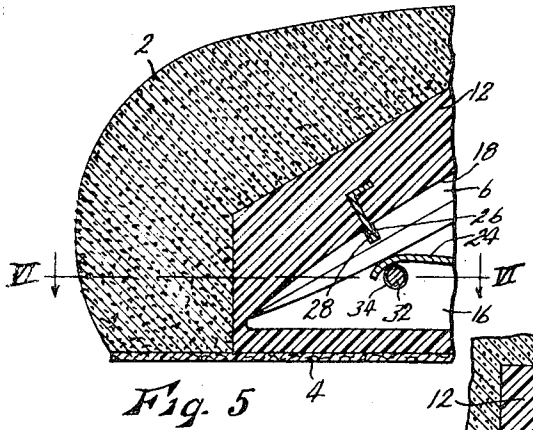


Fig. 5

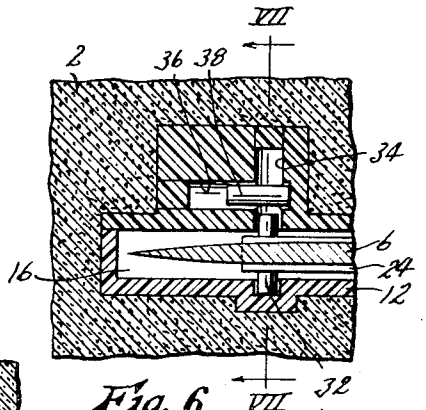


Fig. 6

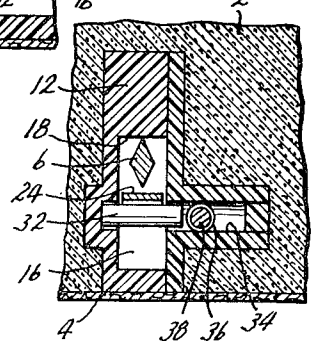


Fig. 7

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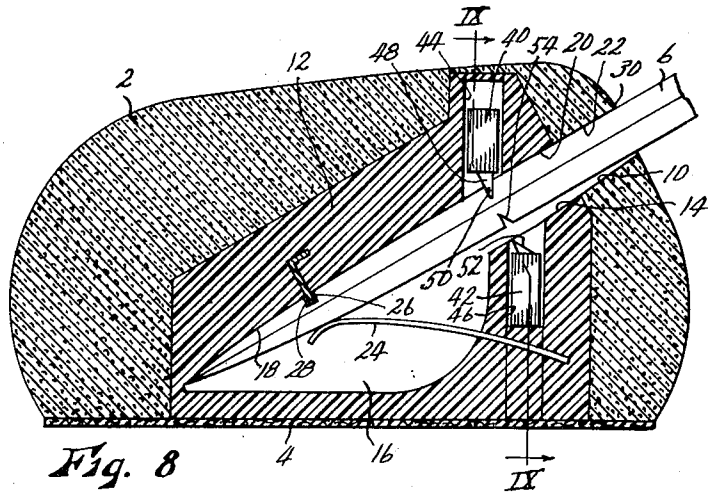


Fig. 8

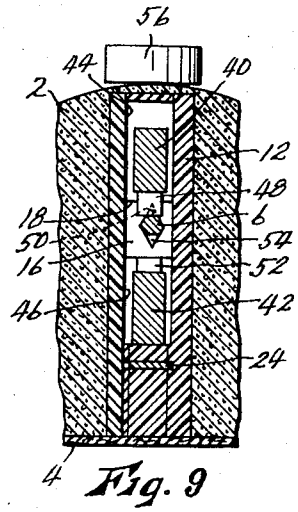


Fig. 9

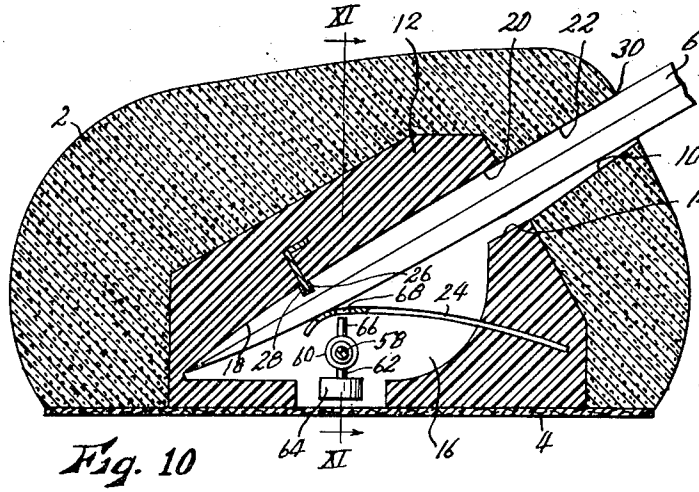


Fig. 10

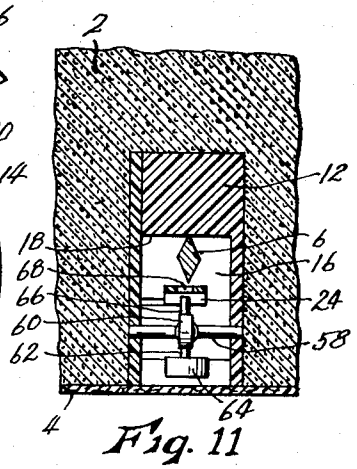


Fig. 11

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PUZZLE TOY

This invention relates to new and useful improvements in puzzle toys, and has particular reference to a puzzle toy consisting of a body member having a rod-like member inserted and secured in an aperture thereof, the object of the puzzle being to withdraw the rod from the body member. The toy may dramatize the ancient legend of the sword of Excalibur, which was according to the legend, thrust into and immovably fixed in a stone, with the promise that whoever could successfully pull the sword from the stone would be the next rightful king of England. This of course is one of the legends of King Arthur. To this end, the body member can be made to resemble a stone, and the rod a sword.

The main object of the present invention is the provision of a toy of the character described having novel and effective means for locking the rod into the body member, said locking means nevertheless being readily releasable to permit withdrawal of the rod by those initiated in the secret of the toy, or clever enough to solve it.

Another object is the provision of a puzzle toy of the character described wherein said locking means comprises a primary lock operable to be released by a predetermined relative movement of said body member and said rod.

A further object is the provision of a puzzle toy of the character described, which, in addition to said primary lock, includes a secondary lock operable to prevent, or render ineffective, the release of said primary lock. Said secondary lock may be releasable by various methods other than that operable to release the primary lock, such by example as by predetermined movements of the body itself, or by a predetermined fixed positioning of the body member, or by placing a magnet in juxtaposition to the body member, or by combinations thereof.

Other objects are simplicity and economy of construction, efficiency and dependability of operation, and the provision of a puzzle toy which is not only uniquely baffling and intriguing, forming a natural conversation piece, but also is very attractive in appearance, constituting a desirable ornament.

With these objects in view, as well as other objects which will appear in the course of the specification, reference will be had to the accompanying drawing, wherein:

FIG. 1 is a side elevational view of a puzzle toy embodying the present invention,

FIG. 2 is a fragmentary top plan view of the toy;

FIG. 3 is an enlarged, fragmentary sectional view taken on line III—III of FIG. 2,

FIG. 4 is a fragmentary sectional view taken on line IV—IV of FIG. 3,

FIG. 5 is a fragmentary view similar to FIG. 3, showing a modification including one type of secondary lock,

FIG. 6 is a fragmentary sectional view taken on line VI—VI of FIG. 5,

FIG. 7 is a fragmentary sectional view taken on line VII—VII of FIG. 6,

FIG. 8 is a view similar to FIG. 3 showing a modification including a second type of secondary lock,

FIG. 9 is a fragmentary sectional view taken on line IX—IX of FIG. 8,

FIG. 10 is a view similar to FIG. 3 showing a modification including a third type of secondary lock, and

FIG. 11 is a fragmentary sectional view taken on line XI—XI of FIG. 10.

Like reference numerals apply to similar parts throughout the several views, and in the form of the invention shown in FIGS. 1–4, the numeral 2 applies to the body member of the toy. Said body member may be molded of plaster, ceramic or other suitable material, may be shaped externally to resemble a stone, as shown, or otherwise as may be desired, and is flattened at its base to rest securely on a desk, table, or the like, said base being covered by a pad 4 of felt or the like to prevent marring of the surface on which it rests. A rod-like member 6, which may be shaped to resemble a sword having its handle 8 disposed exteriorly of the body member, is adapted to have its pointed end portion inserted into an aperture 10 molded in body member 10, through said aperture into an aligned aperture 14 formed in a casing 12, which may be formed of plastic and which is encased within body member 2, and through aperture 14 into the hollow interior cavity 16 of said casing.

The upper wall 18 of cavity 16, as well as upper wall 20 of aperture 14 and upper wall 22 of aperture 10, are shaped to conform to the contour of the upper edge of rod 6, and aperture 10 is shaped in cross-sectional contour to conform to the non-circular (diamond-shaped as shown) cross-sectional contour of rod 6, whereby to prevent rotation of said rod about its axis. Within cavity 16, rod 6 is engaged by the free end portion of a cantilever leaf spring 24, said spring being fixed at one end in casing 12 and projecting into cavity 16 in the same general direction in which rod 6 is inserted. Said spring holds said rod resiliently against the top wall 18 of the cavity, whereby to hold a notch 26 formed in the upper edge of said rod in engagement with a tooth 28 fixed in casing 12 and extending downwardly into cavity 16 through top wall 18 thereof. The faces of said tooth are disposed at right angles to the axis of the rod, and the notch is correspondingly shaped, whereby rod 6 cannot be withdrawn from the body member so long as tooth 28 is engaged in notch 26.

In operation, the rod 6 is introduced into aperture 10 of the body member 2, and moved inwardly until its inner end enters between the free end portion of spring 24 and tooth 28. Since the spring and tooth may be very closely spaced or even abutting at this time, it is desirable that the inner end of the rod be taperingly pointed, as shown. This gives further reason for making said rod resemble a sword. Further inward movement of the rod moves it between the tooth and spring camming said spring downwardly, until notch 26 is aligned with the tooth, whereupon the spring snaps the rod upwardly to engage said notch over said tooth. The rod is then releasably locked into the body member, and the puzzle of course is for a person not familiar with the mechanism to withdraw the rod from the body member, or, in the language of the legend of Excalibur, to "withdraw the sword from the stone". Withdrawal may be readily accomplished by pivoting the outwardly projection portion of rod 6 upwardly with respect to body member 2, using the point 30 at which the upper edge of said rod enters the body member as a fulcrum. This movement forces the portion of the rod within the

body member downwardly against spring 24 until notch 26 clears tooth 28, whereupon the rod may be withdrawn. Even though this is a very simple movement very easily performed, it is really quite surprising how seldom it will occur to persons unfamiliar with the device to try it, and even this simple form of the device is therefore quite puzzling and intriguing. However, various other additions can be made to render the device still more difficult and puzzling to solve, as shown in FIGS. 5–11.

In the modification of the device shown in FIGS. 5–7, all of the structure previously described in connection with FIGS. 1–4 is utilized. In addition, there is provided a locking pin 32 disposed horizontally and transversely to spring 24 and carried for free longitudinal movement in a bore 34 formed in casing 12. Said locking pin is normally operatively disposed, as shown, extending transversely across cavity 16 of the casing just below the free end portion of spring 24, whereby to prevent downward movement of said spring by rod 6 to release notch 26 thereof from tooth 28. However, bore 34 is of such length, at one side of casing 12, that pin 32 can be moved by gravity to an inoperative position in which it does not underlie or obstruct downward motion of spring 24 by tilting body member 2 so that the right end of said pin, as viewed in FIG. 7, is disposed downwardly. Casing 12 also has a second horizontal bore 36 formed therein and intersecting bore 34, at the side thereof toward which bore 34 is extended, and a second locking pin 38 carried freely in said second bore. Locking pin 38 has an operative position, as best shown in FIG. 6, in which it obstructs bore 34 and prevents movement of pin 32 to its inoperative position, and an inoperative position in which it does not obstruct bore 34.

To withdraw rod 6 from body member 2 in the species of the invention shown in FIGS. 5–7, body member is first tilted to the left as shown in FIGS. 5 and 6, whereupon locking pin 38 moves by gravity to its inoperative position, and then to the rear (or to the right as shown in FIG. 7) whereupon locking pin 32 moves by gravity to its inoperative position. Then, and only then, notch 26 of rod 6 can be disengaged from tooth 28 as described in connection with FIGS. 1–4. Rod 6 must be inserted into the body member with both of locking pins 32 and 38 in their inoperative positions, whereupon said locking pins may be moved to their operative positions by reversing the tilting movement already described. Of course, more locking pins, requiring more involved sets of tilting motions, could be used if desired.

FIGS. 8 and 9 show a modification of structure which in addition to all those elements shown in FIGS. 1–4, additionally includes a pair of ferrous bars 40 and 42 disposed vertically and carried nonrotatively in a pair of recesses 44 and 46 formed in casing 12 and respectively above and below aperture 14 of said casing, and opening into said recess. Said bars are freely movable vertically in their recesses. Upper bar 40 carries at its lower end a tooth 48 operable by gravity to engage in a notch 50 formed in the upper edge of bar 6, when notch 26 of said bar is engaged by tooth 28. Lower bar 42 carries at its upper end a tooth 52 operable by gravity, when body member 2 is inserted, to engage in a notch 54 formed in the lower edge of rod 6. The engagement of either of teeth 48 or 52 in their respective notches 50 or 54 locks rod 6 against withdrawal from the body member.

As long as the body member 2 is upright, tilting of rod 6 about point 30 as a fulcrum to free notch 26 from tooth 28 will not free the rod for withdrawal, since tooth 48 will remain engaged in notch 50. Also, if the body member is inverted, tooth 52 will engage in notch 54 simultaneously with the disengagement of tooth 48 from notch 50, so that the rod still cannot be withdrawn. However, recess 44 of top bar 40 extends very close to the top of body member 2. Therefore, if the body member is first inverted to move bar 40 to the top of its recess, and magnet 56 (see FIG. 9) is then brought adjacent the top of the body member, it will retain said top bar in its elevated position, and tooth 48 out of engagement with notch 50, while the body member is again turned to an upright position to allow lower bar 42 to drop to free tooth 52 from notch 54. Then, and only then, the rod may be pivoted at 30 to disengage it from tooth 28 to free it for withdrawal. Magnet 56 will not lift upper bar 40 bodily from its normal position, but will retain it in an elevated position once it has been moved to the top of its recess by inversion of the body member. To insert the rod into the body member, it may be necessary in this form of the invention to maintain top bar 40 in its elevated position, by use of magnet 56, as said rod is inserted in order that notch 28 of the rod can be moved past tooth 48.

FIGS. 10 and 11 show a modification of structure, which in addition to all of the elements shown in FIGS. 1–4, additionally includes a shaft 58 extending horizontally and transversely in spaced relation beneath the free end portion of spring 24, and having its end affixed in casing 12. A mounting member 60 is universally pivoted on said shaft directly beneath the spring. A downwardly extending rod 62 is affixed to said mounting member and has a pendulum weight 64 affixed to its lower end, and an upwardly extending rod 66 has its lower end affixed to said mounting member. The upper end of rod 66 is disposed just below spring 24 when pendulum weight 64 is hanging freely. A hole 68 is formed in spring 24, said hole being of only slightly larger diameter than rod 66, and registered coaxially with said rod when weight 64 is hanging quietly. Casing 12 limits swinging movement of weight 64 to such a degree that the upper end of rod 66 must always be disposed directly beneath spring 24, though not necessarily in registry with hole 68 of said spring.

In the species of FIGS. 10 and 11, rod 6 can be freed for withdrawal by pivoting it at point 30 to release notch 26 from tooth 28, exactly the same as described in connection with the species of FIGS. 1–4, but only so long as pendulum rod 66 is precisely in registry with hole 68 of the spring. If the body member is tilted or agitated to any degree by the person attempting to withdraw the rod 6, rod 66 will move out of registry with hole 68, and will thereafter obstruct downward movement of the spring so that notch 26 cannot be freed from tooth 28. Only by maintaining the body member accurately upright by pressing its base firmly against a table or the like, for a time sufficient to allow the pendulum to come to rest, can rod 6 be tilted for withdrawal. As will be seen in FIG. 11, rod 6 is slightly

offset transversely from the normal vertical axis of rod 66, or rod 6 may have sufficiently great lateral play in apertures 20 and 22, that rod 6 itself will not directly abut rod 66, and its downward movement thereby blocked, as rod 66 projects upwardly through hole 68.

While we have shown and described certain specific embodiments of our invention, it will be readily apparent that many minor changes of structure and operation could be made without departing from the spirit of the invention.

What we claim as new and desire to protect by Letters Patent is:

1. A puzzle toy comprising:
   a. a body member having a hollow interior cavity and an aperture communicating with said cavity and opening exteriorly of said body member,
   b. a rigid, rod-like member adapted to be inserted through said aperture into said cavity to a locking position in which a portion thereof projects outwardly from said body member, said body member aperture and said cavity being enlarged inwardly from the outer opening of said aperture whereby to permit manual lateral pivoting of said rod about its point of entry into said aperture, said rod resting in pivotal engagement with said body member at the outer opening of said aperture, and
   c. cooperating primary locking elements carried respectively by said body member within said cavity and by the portion of said rod within said cavity and operable to secure said rod releasable against withdrawal from said body member, said withdrawal being the object of the puzzle, said primary locking elements being releasable responsively to said manual pivotal movement of said rod relative to said body member.

2. A puzzle toy as recited in claim 1 wherein the portion of said rod normally extending within said cavity is provided with a laterally opening notch formed therein, and wherein said primary locking elements comprise:
   a. a tooth fixed in said body member and projecting into said cavity laterally of said rod whereby to engage in said notch, and
   b. a spring carried by said body member within said cavity in opposed relation to said tooth, whereby as said rod is introduced longitudinally of itself between said tooth and said spring, said spring is deflected and operates to urge said rod laterally of itself to move the notch thereof into engagement with said tooth, and to yieldably maintain said engagement.

3. A puzzle toy as recited in claim 2 wherein the end of said rod inserted into said body member cavity is taperingly pointed, whereby to facilitate its insertion between said tooth and said spring.

4. A puzzle toy as recited in claim 1 with the addition of secondary locking means carried by said body member and functioning when operative to render said primary locking elements inoperable to release said rod for withdrawal, said secondary locking means being rendered inoperative by pre-determined, non-obvious bodily placement of said body member.

5. A puzzle toy as recited in claim 4 wherein said secondary locking means includes a first lock member mounted freely in a hollow of said body member, said first lock member being movable in relatively opposite directions by gravity when said body member is tilted in relatively opposite directions, between an operative position in which it prevents release of said primary locking elements, and an inoperative position in which it does not inhibit release of said primary locking elements.

6. A puzzle toy as recited in claim 5 wherein said secondary locking means includes additionally a second lock member mounted freely in a hollow of said body member, said second lock member being movable in relatively opposite directions by gravity when said body member is tilted in relatively opposite directions in a plane disposed angularly to the plane of tilting causing movement of said first lock member, between an operative position in which it obstructs movement of said first lock member toward its inoperative position, and an inoperative position in which it does not obstruct movement of said first lock member.

7. A puzzle toy as recited in claim 5 wherein said rod has a transversely opening notch formed in the portion thereof normally disposed within said body member cavity, wherein said primary locking elements include a tooth fixed in said body member and extending into said cavity laterally of said rod and engaging in said notch, and a cantilever spring fixed in said body member with its free end portion disposed in said cavity in opposed relation to said tooth whereby to urge said rod laterally toward said tooth to maintain said notch in engagement with said tooth, and wherein said first lock member of said secondary locking means consists of a pin carried loosely in a bore of said body member intersecting said cavity transversely of said rod in closely spaced relation to the side of said spring opposite to that at which said rod is disposed, said pin when in its operative position intersecting said cavity to obstruct movement of said spring away from said tooth.

8. A puzzle toy as recited in claim 4 wherein said secondary locking means comprises a pendulum supported for free universal pivoting movement in the cavity of said body member, said pendulum being operable at all positions of its pivotal movement relative to said body member, except one such position, to obstruct and prevent release of said primary locking elements.

9. A puzzle toy as recited in claim 8 wherein said body member has a planar base, and wherein said one position of said pendulum occurs when said base is rested on a planar horizontal surface, and said pendulum is at rest.

10. A puzzle toy as recited in claim 8 wherein said rod has a transversely opening notch formed in the upper edge of the portion thereof normally disposed within said body member cavity, wherein said primary locking elements include a rigid tooth fixed in said body member and extending downwardly into said cavity for engagement in said notch, and a cantilever spring fixed in said body member with its free end portion disposed in said cavity beneath and in opposed relation to said tooth whereby to urge said rod laterally toward said tooth to maintain said notch in engagement with said tooth and wherein said pendulum is pivoted in said cavity beneath the free end portion of said spring, said pendulum having an upward extension the upper end of which is normally disposed in closely spaced relation beneath said spring, and said spring having a

hole formed therein of a size to pass over said pendulum extension as said spring is moved downwardly by pivotal movement of said rod, said pendulum extension obstructing and preventing movement of said spring except when said hole is aligned therewith.

11. A puzzle toy as recited in claim 10 wherein said body member is provided with a planar base, and wherein said pendulum extension is aligned with the hole of said spring only when said base is supported horizontally, and said pendulum is at rest.

* * * * *