Feb. 13, 1951 G. WEISS 2,541,392

TOY EJECTING DEVICE

Filed Feb. 4, 1949

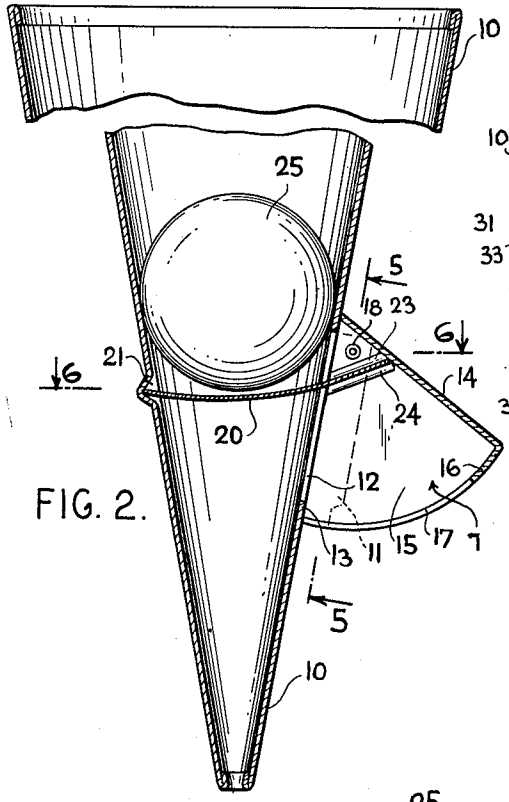


FIG. 2.

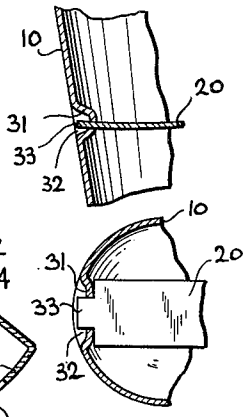


FIG. 8.

FIG. 7.

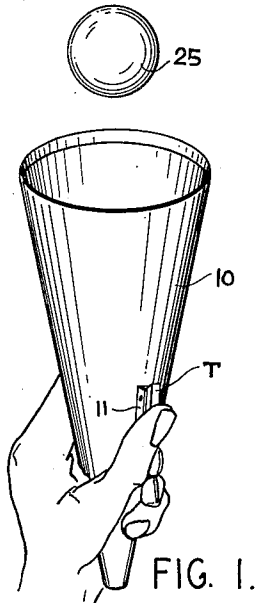


FIG. 1.

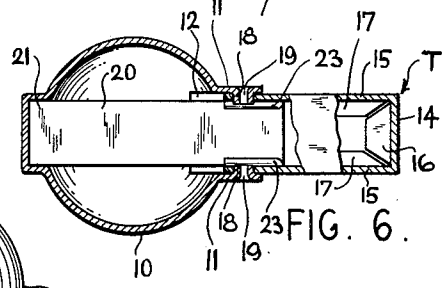


FIG. 6.

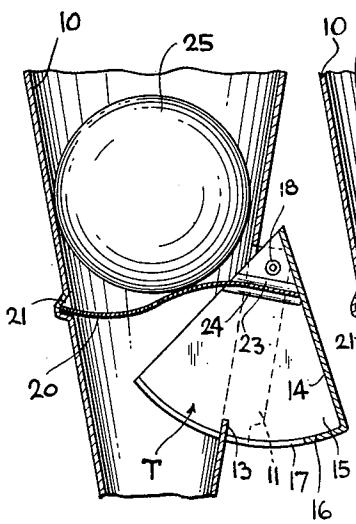


FIG. 3.

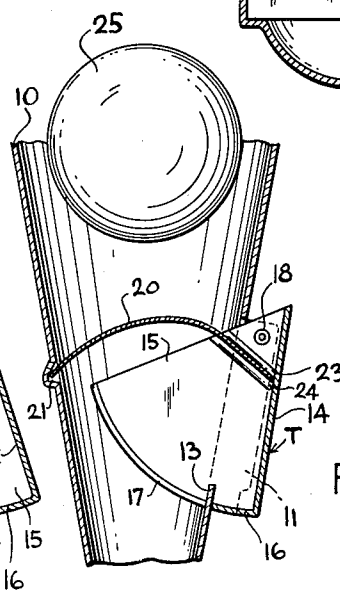


FIG. 4.

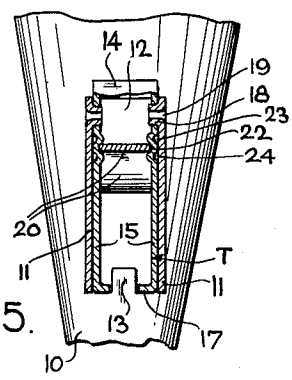


FIG. 5.

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TOY EJECTING DEVICE

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11 Claims. (Cl. 273—96)

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This invention relates to a holder device for forcibly propelling or ejecting a ball or other object therefrom. The device is particularly adapted for use in conjunction with a ping-pong ball or cork ball, and is especially suitable for use as a toy, a ball game, or an amusement device.

It is an object of this invention to provide such a toy device, in which no separate loading operation is required, the closing of the trigger first setting the release mechanism in position for operation, and then firing said release mechanism to eject the ball.

Another object of the invention is to provide a ball ejecting device in which the ejecting or impelling is accomplished by a blade spring which is fixed to exert an upward force to eject the ball from the device.

Another object of this invention is to provide a ball ejecting device having simple means to eject a ball therefrom by simply pressing the trigger member thereof, which device can then be used to catch the ball therein without the necessity of shifting the player's hand.

Still another object of the invention is to provide a ball ejecting device which consists of a minimum number of parts which can be easily manufactured and assembled; which is efficient and amusing in operation; and which requires no skill to play with as a game.

Still another object of the invention is to provide a ball ejecting device employing a spring under tension as the ejecting means, in which the whole cycle of achieving tension and releasing the same is accomplished in one motion.

Other objects will be stated in the annexed description and drawing, which illustrates a preferred embodiment thereof.

Fig. 1 is a perspective view showing the device grasped in the player's hand with the thumb on the trigger, and also showing the ball in ejected position, ready to be caught in the device as the ball descends;

Fig. 2 is a vertical section through the device, with the ball at rest therein, the upper part of the holder being shown broken away for the convenience of illustration. The trigger is shown in the normal open position, and the blade spring in its normal flexed inactive position;

Fig. 3 is a view similar to Fig. 2, the holder being shown broken away. The trigger is shown partly closed, and the blade spring in its intermediate distorted position, just prior to its final upward arching;

Fig. 4 is likewise a view similar to Fig. 2, the

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holder also being shown broken away. The trigger is shown in closed position, the blade spring in the fired position, and the ball ejected or impelled upwardly;

Fig. 5 is a sectional view along line 5—5 of Fig. 2, the holder being broken away for the convenience of illustration;

Fig. 6 is a sectional view along line 6—6 of Fig. 2;

Fig. 7 is a fragmentary detailed view of a modified form of the blade spring retaining means; and

Fig. 8 is a partial sectional view of the construction and assembly shown in Fig. 7.

In the following description, the dimensions and directions are in accord with the positions of the device shown in the drawings. For example, the axis of the cone-shaped holder is considered to be vertical. This, however, is solely for convenience. The device may be used in a variety of positions and need not be held vertical.

The device comprises a hollow substantially cone-shaped holder or receptacle 10, which may be made of metal or which can be readily molded from plastic or pulped paper. Holder 10 is normally held in the position shown in the drawings, with the apex of the cone at the bottom and the base or mouth thereof at the top. In other words, the holder 10 tapers uniformly upwardly from a bottom point to its circular top.

A pair of relatively narrow, laterally alined and spaced guide-walls 11 are provided, said walls being integral with holder 10 and being substantially parallel to each other. That portion of holder 10 intermediate said walls 11 is cut away to form a recess or opening 12. An upwardly extending stop-member or projection 13 is integrally formed from holder 10, said member 13 being located intermediate the lower ends of guide-walls 11 and projecting into recess 12 from the bottom edge thereof.

When holder 10 is made of metal, guide-walls 11 may be formed by making cuts or incisions in the circumferential wall of the holder. The cut portions are then pushed out until they are parallel, thus forming the guide-walls 11. When the said walls are set up in this manner, they are respectively formed with cut-out portions or notches in their lower free corners, thereby forming the stop 13.

Trigger T is preferably made of metal, and is preferably formed from a single blank of material. Optionally, trigger T may be made of wood, plastic or any other suitable material. Trigger T comprises a front wall section 14 which

is substantially rectangular in shape, and two spaced side wall sections 15, which are integral with wall 14, and which are substantially parallel to each other. Each section 15 is shaped like a sector of a circle, with its arcuate edge serving as a bottom edge.

The bottom portion of trigger T is provided with an inwardly extending rear stop or tab member 16, which is integral with section 14. Said bottom portion is also formed with two inwardly extending lateral slide members 17 which are respectively integral with their respective sections 15. The longitudinal free edges of members 17 are spaced from and parallel to each other to form a channel therebetween which is open at the front end and terminated at the rear by wall section 14. This is clearly shown in Fig. 6.

Trigger T is pivotally mounted adjacent its top between guide-walls 11. For this purpose, each wall 11 has formed therein a circular hole 19 with an upstanding flange 18 projecting inwardly to serve as a bearing. Said bearings 18 are clearly shown in Figs. 5 and 6. Bearings 18 respectively fit within holes or recesses 19 in sections 15 of trigger T. Optically, trigger T may be pivotally mounted intermediate guide-walls 11 by means of pivot pins passing through alined holes in respective pairs of walls 11 and 15, and suitably secured therein.

When trigger T is thus mounted, its interior is relatively inaccessible, and yet there is freedom of pivotal movement. The abutment of the upper edge of wall section 14 against holder 10 limits the outward movement of trigger T, as is shown in Fig. 2. In this position, side wall sections 15 of trigger T are located intermediate guide-walls 11.

When trigger T is pushed into the position of Fig. 3, in which position the device is loaded, sections 15 fit against the sides of recess 12, and stop 13 lies in the channel in the base of trigger T, intermediate members 17. There is consequently little lateral movement of trigger T.

When trigger T is pushed into the ejecting position of Fig. 4, stop 13 abuts stop 16 to prevent further inward movement. Upon release, trigger T is free to return to the normal inactive position of Fig. 2.

The impelling or ejecting mechanism comprises a leaf or blade spring 20, which is made of springy steel or other suitable resilient metal. One end of blade spring 20 abuts holder 10 at a point diametrically opposite opening 12. Holder 10 is indented or beaded outwardly to form a recess 21 in which the end of spring 20 is located.

The other end of blade spring 20 is held within two guide channels 22, which are respectively formed on the opposed inner faces of sections 15 of trigger T, below openings 19. Each channel 22 is a narrow substantially straight groove between ridges or raised portions 23 and 24 in the associated section 15. Ridges 23 and 24 are formed by indenting or beading sections 15 inwardly. Said ridges 23 and 24 are respectively parallel to each other and extend across each respective member 15.

When trigger T is in the inactive position of Fig. 2, the ends of channels 22 which are respectively adjacent to section 14 are higher than the opposite ends of channel 22 which are adjacent to opening 12. As a result, channels 22 slope downwardly. The lower ends of channels 22 are preferably slightly above or in the same level as recess 21.

Blade spring 20 has preferably a slightly greater length than the respective lengths of channels 22 combined with the distance between opening 12 and the back of recess 21. As a result, when trigger T is in the position of Fig. 2, spring 20 is under slight tension and is curved or flexed slightly downwardly so that its top face becomes concave. The curve cannot be upward, because channels 22 direct and flex spring 20 downwardly.

When trigger T is in the position of Fig. 2, a light ball 25 such as a ping-pong ball or cork ball or other object may be inserted in the wide open top end of holder 10. When the downward movement of inserted ball 25 is arrested by the coming of said ball into abutment with the circumferential wall of holder 10, the bottom of ball 25 is preferably close to but not touching blade spring 20.

As trigger T moves toward the position of Fig. 3, section 14 moves toward holder 10. The back ends of channels 22 likewise move toward holder 10, thus decreasing the distance between the ends of blade spring 20. This causes spring 20 to flex or bend further.

It is impossible, however, for the flexing or bending of blade spring 20 to take place in the normal manner, which would be in a direction to accentuate the downward bow of spring 20 resulting from the position in Fig. 2 of trigger T. Such normal bending is impossible, because channels 22 move toward a horizontal position, and then to the position of Fig. 3, in which the back ends of channels 22 are below the ends of said channels adjacent holder opening 12.

As a result, blade spring 20 becomes distorted. The portion of said spring near recess 21 bends normally downwardly. The channel portion of spring 20 perforce follows channels 22. The center portion of spring 22 is abnormally bent, thereby imparting a sinuous effect to said spring.

When trigger T is in the position of Fig. 3, blade spring 20 preferably abuts ball 25, which still rests against holder 10. This may be considered the loaded position of trigger T. When trigger T is moved to some point beyond that of Fig. 3, it reaches the fired or ejecting position. Certainly, by the time stop member 16 abuts holder stop 13, in the position of trigger T of Fig. 4, firing or ejecting has been accomplished.

As trigger T is moved beyond the position of Fig. 3, the distortion of blade spring 20 continues and increases until the portion of said spring which is inclined or bent downwardly, snaps upwardly. This upward snap is sudden, rapid and with considerable force. Spring 20 then becomes flexed upwardly so that its top face becomes convex, as clearly shown in Fig. 4, which is a normal, undistorted position. This change causes the portion of blade spring 20 which is in contact with ball 25 to move upwardly, rapidly and with a great deal of force. A considerable impetus is thereby imparted to ball 25, causing it to fly out of holder 10.

When trigger T is released, the tension of blade spring 20 pushes trigger T outwardly, and said spring and trigger return to their normal inoperative positions of Fig. 1.

The second embodiment of my invention is similar to the first embodiment, except that different means are provided for securing the outer end of blade spring 20 to holder 10. The modified form of such spring retaining means is shown in Figs. 7 and 8.

Referring to said Figs. 7 and 8, holder 10 is indented inwardly to form an inwardly extending

projection 31. Blade spring 20 is formed at its outer end with a tongue 33 which passes through a slot 32 formed in projection 31. Said tongue does not project beyond the depression in the circumferential wall of holder 10 resulting from indenting said holder to form projection 31.

The assembly thus described presents a number of characteristic features most of which result from the particular form and mounting of the resilient element, spring 20, and its relation to the trigger T. As shown in Fig. 2 for instance, presenting the inactive position of the assembly, and in Fig. 6, the spring 20 is formed of planar sheet material of uniform width and length dimensions, is comparatively thin and is of resilient type. The spring extends diametrically from one side of the internal wall face of the conical element or holder 10, its opposite end portion being extended through the opposite wall and into the trigger T where it is anchored, the end of the spring opposite such anchored end being free from connection with its wall, but having a fixedly located position in which it is capable of swinging as though pivoted, no actual pivot being present however, the spring end and wall having a contact engagement.

The end portion of the spring that is anchored within the trigger is permanently planar, due to the anchoring, the remainder of the spring, however is capable of flexing. The anchored portion is located within the trigger below the pivot 18 of the latter and is adapted to swing through an arc when the trigger is moved, the inactive position of the latter being such that the direction of length of the planar anchored portion extends angularly downward in such position and becomes horizontal and then passes to an upwardly inclined position as the trigger swings through its arcuate movement from the inactive position.

The length of the spring is greater than the distance between the position of the free end of the spring and the position of the anchored end portion when the trigger is in inactive position so that the portion of the spring intermediate its end portions is slightly curved lengthwise in such position, the curvature being of concave characteristic since the inclined direction of length of the anchored portion forces the spring to assume such curvature. It is understood that the extended anchored portion tends to influence the spring portion in the immediate vicinity of such anchored portion as to the direction in which it extends toward the free end of the spring.

This latter will be understood by comparing Figs. 2 and 3, the latter presenting an intermediate position in the swing of the trigger, the latter having moved a distance sufficient to carry the anchored portion through the nadir point of the circle and become upwardly inclined to a small degree. In swinging through the nadir point in which the anchored portion would extend horizontally, the concave form of the spring, in the vicinity of the anchored portion (Fig. 2) has been forced upwardly by the change in direction of length of the anchored portion, but without affecting the concave form of the other end of the spring so that when the trigger movement had progressed to the position of Fig. 3, the spring portion in the vicinity of the anchored portion has had its shape actually changed to convex characteristic. This is due not only to the shifting of the angularity of the direction of length of the anchored portion referred to, but also to the additional fact that the distance between the position of the free end of the spring and the anchored portion at the opposite end of the spring is being reduced through the swinging of the trigger, thus increasing the effect of the combined action by forcing the change to be exaggerated. This exaggeration is in two directions, in depth of the change as well as in the length of the portion in which the change is effected. For instance, as the spring portion adjacent the anchored portion reaches the nadir point and is slightly raised above the concave showing of Fig. 2, the raise affects only this adjacent portion due to the fact that the endwise pressure on the spring from the shortening distance prevents the opposite end portion of the spring from also rising. The effect is seen in Fig. 3 in which both the convex portion adjacent the trigger and the concave portion at the opposite end of the spring are present, these portions blending into each other in a mid portion position and giving a sinuous shape to the spring length. In practice, this blending portion is not stationary, but varies with the movement of the trigger. It is closer to the trigger than shown in Fig. 3 as the anchored portion passes the nadir, and progressively moves in the direction of the spring free end portion as the trigger advances in its swing.

This latter results from the fact that the shift of the anchored portion during the advance increases the depth of the convex portion and thereby increases the tension value of this portion of the spring while the tension value of the concave portion does not increase, the pressure produced by the greater tension value causing the convex portion to grow in depth as well as length, the concave portion gradually losing depth and length. In other words, during the movement of the trigger from its inactive position to the firing point, there is constant change in the shape of the spring longitudinally, with the convex portion gradually growing and the concave portion gradually waning, and with the convex portion gradually gaining increasing tension value, the blending portion moving toward the free end of the spring.

This development of the cycle continues until the concave portion becomes of short length and depth through the advance of the blending portion together with a development of a growing differential between the two portions in favor of the convex portion, this continuing until the tension of the convex portion overpowers the tension resistance of the concave portion, whereupon the latter instantly shifts from its concave form past the dead center and becomes merged with the convex portion to form the end portion of the latter, the loose mounting of the free end of the spring permitting the sudden shift instantly. This shift of the concave end portion into merging relation with the convex portion has the effect of instantly eliminating the blending portion referred to, the movement of this portion of the spring in making the change being accompanied by a loud snap sound.

As will be understood, this sudden merging of the two portions suddenly increases the depth and length of the convex portion with consequent sudden increase in the tension value of the spring. It is the effects produced by this sudden merging that gives the ball that is resting thereon its upward discharging impetus. In effect, the cycle outlined develops a gradual increase in tension value through the development of the differential in pressure conditions until

the concave end portion can no longer resist the greater power present in the convex portion and suddenly shifts into the merged relation. The action is due to the fact that the trigger pressure is being applied endwise of the spring and to the shortening of the distance between the opposite end portions of the spring produced by the movement of the trigger.

When the cycle is completed and the ball discharged, the pressure is removed from the trigger, the spring and trigger then automatically returning to the inactive positions. During the return movement, the spring does not have the particular cyclar development referred to since the trigger is moving in a direction to increase the distance between such end portions. In practice the convex form shown in Fig. 4 is maintained until the anchored portion practically reaches the nadir point or its vicinity, thus beginning reversal of the inclination of the anchored portion and applying downward pressure on that end of the spring which is then but slightly convex. This pressure causes the spring to rapidly elongate with increased inclination of the anchored portion and increase in pressure sufficient to cause the spring to pass across the "dead center" point into the slight concave form of Fig. 2, the inactive position of the spring. As a result, the assembly is automatically reset for a succeeding cycle.

As will be understood, this cycle of development is made possible through the fact that the side edges of the spring are unconfined. Only the end portions are affected by the mounting so that the various changes which take place are present throughout the width of the spring thus limiting the changes to the direction of length of the spring which are similar throughout the transverse width of the spring. Hence the flexing is in the direction of length and is uniform throughout the width of the spring, the side edges being free to move with the intermediate portion of the width. This permits the ready "growing" and "waning" actions referred to without requiring excessive pressure or distortion of the spring laterally, ensuring long life to the spring as well as efficient operation.

The operation of the device is identical irrespective of whether the first or second described blade spring retaining means are employed. It is important that the blade spring is of sufficient length to be held under tension and flexed downwardly. As the trigger is closed, the blade spring is placed under further tension and the guide channel means rotates to swing one portion of said spring upwardly. This results in distortion of the blade spring, and as the trigger is further closed, the remainder of the spring snaps upwardly forcibly and rapidly, thereby exerting an upward force on the ball or other object within the holder. An important part of the invention is that the foregoing complete cycle of achieving tension and releasing the same is accomplished in one motion, that is in the single operation of closing the trigger. Because of this, the device may be used by a child, and no skill is required to operate the same. In addition, the trigger can be readily actuated by the player's thumb without shifting or moving the hand, so that the player can concentrate on catching the rapidly descending ejected ball without shifting his hand in the least. Making the device cone-shaped is particularly advantageous in the holding and manipulating thereof. A tapering circumferential wall for the holder is particularly comfortable for the player, and the device can be thereby conveniently held and handled.

In describing the preferred embodiments of my invention, I have indicated optional constructions of certain of the parts. Many other changes may be made without departing from the scope or spirit of my invention.

For example, the ball holder need not be conical, but instead may be of other shapes and configurations. The ball holder may be provided with other means, or no means, for stopping the ball above the blade spring. Completely different guide channel means in the trigger may be provided, as long as they are of equivalent function. The construction of the trigger may be modified. Other means, besides a trigger, may be used for pivoting the guide channel means. The means for securing the blade spring to the ball holder may be modified. Other changes may be made without departing from the spirit of the invention.

What is claimed is:

1. A toy ejecting device comprising a holder member having an opening formed therein, a trigger pivotally attached to said holder, said trigger being movable within said opening in said holder, guide channel means secured to said trigger, a blade spring, one end of said spring being positioned in fixed location with said holder member at a point opposite to the holder opening, the other end of said spring being secured within said guide channel means, said spring normally biasing said trigger outwardly, said guide channel means sloping downwardly from the outer face of said trigger toward said opening in said holder member when said trigger is in its normally biased position, said guide channel means being shifted to slope upwardly from the outer face of said trigger toward said holder opening when said trigger is pushed inwardly against the biasing action of said spring.

2. A toy device for ejecting an object therefrom, comprising a hollow, cone-shaped holder member which is open at the base, an opening in the circumferential wall of said holder, guide-walls integral with said holder at opposite side edges of said opening, a stop member integral with the bottom edge of said opening and projecting outwardly from said opening, a trigger mechanism, the side walls of said trigger mechanism being respectively pivotally attached to the respective guide walls, stop means secured to said trigger mechanism to limit outward movement by striking against the circumferential wall of said holder, further stop means secured to said trigger mechanism to limit inward movement by striking against said stop member which is integral with said holder, guide channel means integral with said trigger wall, a blade spring located in said holder, one end portion of said blade spring being secured within said guide channel means, the other end of said blade spring being positioned in fixed location with said holder, said blade spring normally holding said trigger mechanism under tension in its outward position, said guide channel means thereby sloping downwardly from the outer face of said trigger mechanism toward said opening in said holder, said blade spring being thereby flexed toward the apex of said holder, said guide channel means being shifted to pivot upwardly from the outer face of said trigger mechanism toward said opening when said trigger mechanism is moved to its inward position, said blade spring being thereby

snapped so that it is flexed toward the base of said holder.

3. In toy assemblies for amusement purposes, wherein the assembly is operative to forcibly eject a light missile from the assembly at will, an assembly of such type including an open-mouth holder for the missile at rest, an elongated missile-impelling member of sheet form and of blade spring type traversing the bore of the holder transversely of the holder, said member having its side edges unconfined intermediate the member end portions, and a trigger element pivotally mounted on and projecting externally of the holder at least when in repose, said resilient member having one end portion positioned in fixed location on a wall of and within the holder and its opposite end portion anchored to the trigger to thereby present said member as approaching a planar form when in repose and to provide the missile-ejecting activity by pressure exerted by trigger movement and applied to the member endwise and in the direction of length of the member to progressively decrease the distance between the end portions of the member and to provide distortion of the member from its repose form by and during such pressure application, the member distortion development presenting a progressively varying form changing regimen culminating in an arcuate form completed suddenly and with a snap action to provide the ejecting power for the missile.

4. An assembly as in claim 3 characterized in that the resilient member in inactive position is of slightly concave form, the form changing regimen development providing an initial distortion into a sinuous contour formed of an individual convex section adjacent the anchored end portion and a concave section in the opposite end portion, said sections being blended into one another in an intermediate portion approximately equidistant from the opposite ends of the member, the continued advance of the trigger causing the convex section to progressively increase in dimensions with the dimensions of the concave section progressively decreasing, the regimen continuing until the dimensions of the concave section have been reduced to a point where its resistance is unable to further resist the growing power of the convex section and shifts to convex form and merges into the growing convex section to produce a complete reversal from the inactive concave contour to a complete convex curvature, the shift being sudden and with snap action and active to suddenly increase the dimensions and power of the growing convex section into the missile ejecting value.

5. An assembly as in claim 4 characterized in that upon ejection of the missile, release of the trigger automatically returns the trigger to its inactive position and concurrently restores the resilient member to its slightly concave curvature with the regimen of member curvature restoration provided by the gradual increase in distance between the positioned ends of the member by trigger movement and to thereby progressively reduce the convexity of the member until approaching planar form, the ending portion of the retreat of the trigger being operative to shift the member from convex to concave curvature by applying downward pressure upon the anchored end portion of the member.

6. An assembly as in claim 5 characterized in that the trigger and member are connected in an anchored relation of extended planar type with the anchored end portion of the member located in spaced relation to and below the trigger pivot to thereby cause the anchored portion to bodily traverse an arcuate path about the pivot, said path being such as to place the end portion plane as extending normal to the axis of the holder when the trigger is at an intermediate point of its advance and retreat to thereby cause the resilient member portion immediately adjacent the anchored end portion to traverse the path in upward direction during advance of the trigger and in downward direction during retreat of the trigger, the opposite end of the anchored portion traversing its path in downward direction during advance of the trigger and upward during trigger retreat.

7. An assembly as in claim 3 characterized in that the holder is of elongated conical type and internally dimensioned to position and support the missile in spaced relation to the resilient member when the assembly is in inactive condition, the member and missile being brought into contact during the early portion of the advance of the trigger, the missile being moved from such holder supported position by the continued advance of the trigger and through continued contact with the resilient member until the instant of missile ejection.

8. An assembly as in claim 3 characterized in that the resilient member is of concave form when in repose and is developed by progressive form-changing activities into convex form at the close of the progressive development to thereby produce the power source for missile ejection, the assembly being further characterized in that upon trigger release from pressure the resilient member is immediately and automatically returned by the member developed power to its repose position and concave form to thereby reset the member and trigger for a succeeding repetition of the cycle.

9. An assembly as in claim 3 characterized in that the configuration of the trigger element in side elevation approximates that of the segment of a circle, with the location of its pivot axis within the apex of the configuration, said element being of shell type and having the anchoring portion of the resilient element in the vicinity of but spaced from such pivot axis position and having the direction of length of the anchoring portion extending normal to a plane extending radially of and approximately bisecting the segment.

10. An assembly as in claim 9 characterized in that the sides of the trigger element are of planar form and of sheet formation, with opposing inner faces carrying means cooperative with the end portion of the resilient element in producing the anchoring portion of the latter, said trigger element also carrying stop means cooperative with the holder to limit the range of pivotal movement of the trigger element and thereby assure the curvature of the resilient member in its position of repose.

11. In toy assemblies for amusement purposes, wherein the assembly is operative to forcibly eject a light charge from the assembly at will, an assembly of such type comprising a holder adapted to carry and support the charge during inactivity of the assembly, and mechanism permanently carried by the holder for subjecting the charge to suddenly applied pressure activity to thereby forcibly eject the charge from the holder in substantially predetermined direction, said mechanism including a trigger element piv-

otally supported on the holder, and an elongated resilient member of sheet form and of blade spring type traversing a bore of the holder, said resilient member having one end portion fixedly anchored to the trigger element and movable therewith with the anchoring position in the vicinity of but spaced from the trigger pivot to thereby cause bodily swing of the anchored end portion arcuately about such pivot, the opposite end portion of the member being positioned in fixed location on a wall of the holder opposite the wall carrying the trigger pivot, whereby movement of the trigger on its pivot will vary the distance between the opposite end portions of the member, said member length being sufficiently in excess of the planar distance between the ends of the member when the assembly is inactive or repose position as to cause the member to assume a slightly concave relation to such distance plane in such repose position, advancing movement of the trigger when rendered active serving to initially move the anchored end portion of the member bodily in arcuate direction toward and to intersect such plane to thereby develop a convexity relative to such plane within the member portion adjacent the anchored end and to deform the member into connected convex and concave portions relative to such plane with the connecting point between such portions

crossing the plane approximately mid-length of the latter, continued advance of the trigger serving to increase the length of the convex portion of the deformed member and decrease the length of the concave portion to thereby advance the connecting point of the portions along such plane until the power of the convex portion of the member overcomes the resistance of the remaining concave portion of the member and thereby cause such remaining concave portion to snap across such plane into merging relation with the convex portion suddenly to increase the arcuate form, power and dimensions of the convex portion and completely convert the member into a temporary convex formation, the snap and increase activities providing the effective power for ejecting the charge from the assembly.

GERHART WEISS.

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