C. HOFER.

DETONATING TOY.

APPLICATION FILED MAY 1, 1920.

1,367,391.

Patented Feb. 1, 1921.

2 SHEETS—SHEET 1.

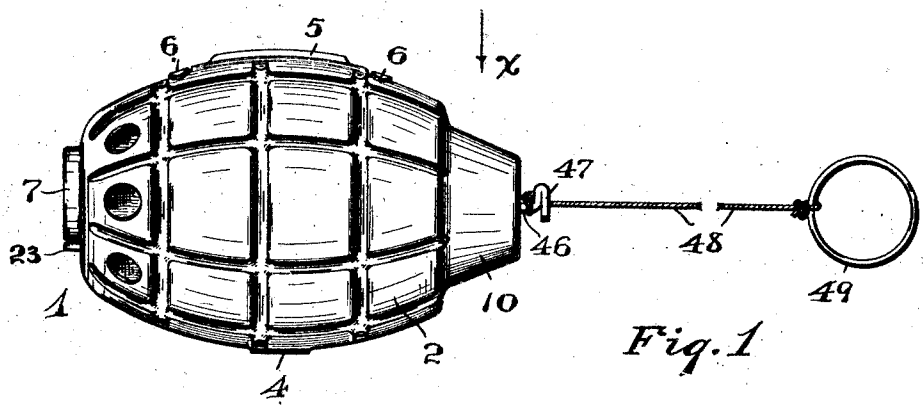


Fig. 1

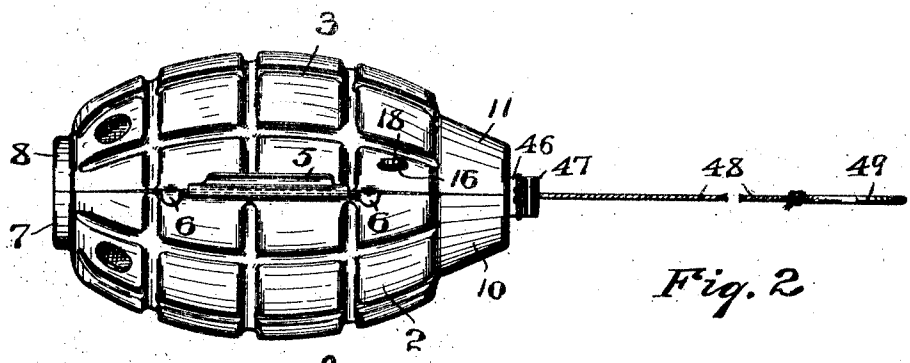


Fig. 2

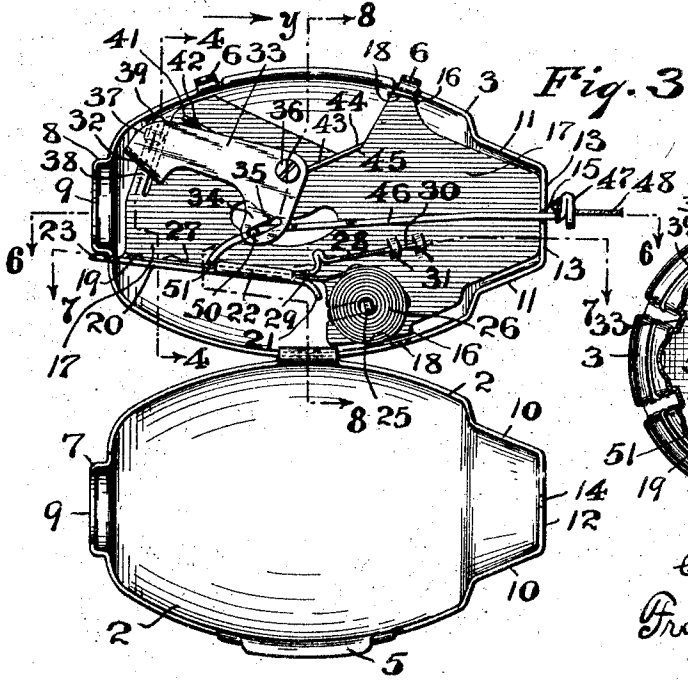


Fig. 3

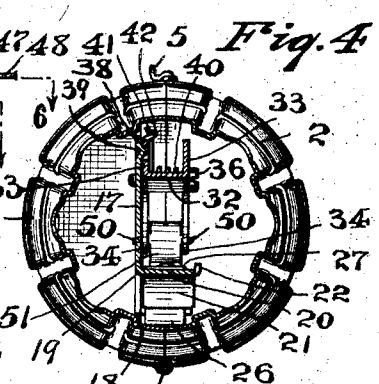


Fig. 4

INVENTOR:
Charles Hofer,
BY
Fraentzel and Richards,
ATTORNEYS.

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2 SHEETS—SHEET 2.

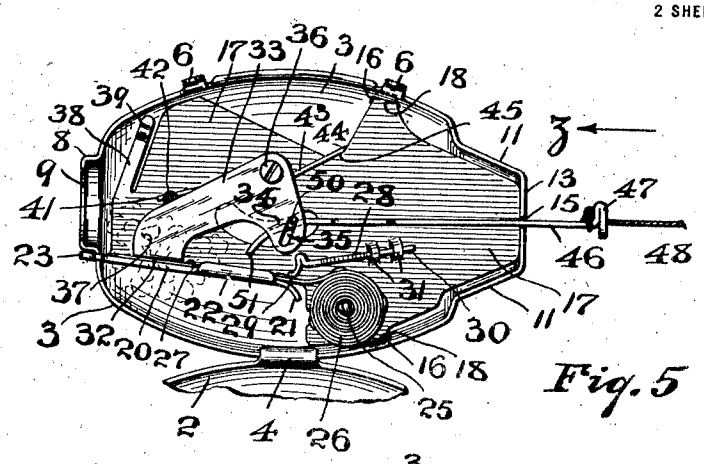


Fig. 5

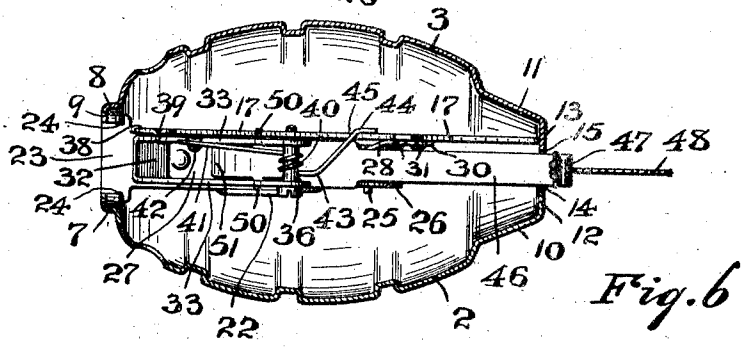


Fig. 6

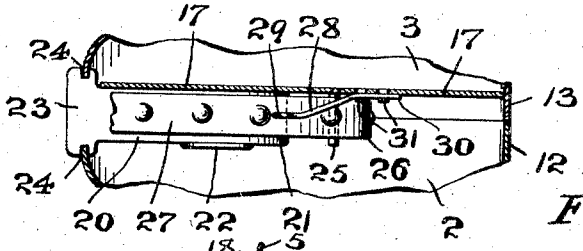


Fig. 7

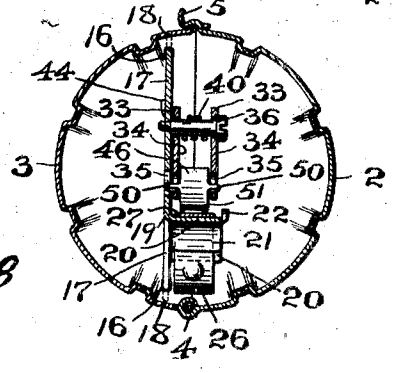


Fig. 8

INVENTOR:

Charles Hofer,

BY

Fraentzel and Richards

ATTORNEYS.

UNITED STATES PATENT OFFICE.

CHARLES HOFER, OF NEWARK, NEW JERSEY.

DETONATING TOY.

1,367,391. Specification of Letters Patent. Patented Feb. 1, 1921.

Application filed May 1, 1920. Serial No. 378,221.

To all whom it may concern:

Be it known that I, CHARLES HOFER, a citizen of the United States, residing at Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Detonating Toys; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to characters of reference marked thereon, which form a part of this specification.

This invention relates, generally, to improvements in detonating toys; and, the present invention has reference, more particularly, to a novel and simply constructed detonating device in the form of a toy hand-grenade, which when thrown in the air by the operator releases an exploding mechanism for firing or exploding the usual percussion or paper cap.

The present invention has for its principal objects to provide a novel, simple and cheaply constructed, and readily assembled cap-exploding mechanism inclosed in a shell or capsule made in the shape and form of a bomb or hand-grenade, in the structure of which the various parts have been reduced to a minimum, and in which the said parts are designed to be made of stamped sheet metal.

The invention has for its further object to provide in connection with an inclosing shell or capsule, made in separable halves, a combined paper-cap feeding and exploding mechanism located within the closed members of the shell, the said mechanism being provided with a manually operated cap-engaging member or element, for primarily feeding a percussion or paper cap into position for explosion, and secondarily for bringing the exploding or detonating trigger into a spring-held raised position, the said cap-engaging or feeding member or element having an end-portion projecting from within the closed members of the shell, and having attached thereto a flexible connection, as a string, which is held in the hand, when the closed shell or capsule is thrown into space, and which string, as the shell or capsule reaches the limit of its flight, produces a sudden jerk and pull upon the cap-engaging member or element, said member or element at the same time releasing the trigger from its raised position, and by the action of a spring allowing the hammer-end of the trigger to be brought forcibly into exploding engagement with the percussion or paper-cap, and thereby firing or exploding the latter with a loud report.

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

With the various objects of the present invention in view, the said invention consists, primarily, in the novel toy-detonating device, in the form of a hand-grenade, hereinafter set forth; and, the present invention consists, furthermore, in the novel arrangements and combinations of the various devices and parts, as well as in the details of the construction of the said parts, all of which will be more fully described in the following specification and then finally embodied in the clauses of the claim, which are appended to and which form an essential part of the said specification.

The invention is clearly illustrated in the accompanying drawings, in which:—

Figure 1 is an elevation of the detonating toy; and Fig. 2 is a view of the same looking in the direction of the arrow X in Fig. 1, both of said views showing the hinged members comprising the shell or capsule of the device in their closed relation.

Fig. 3 is a view of the device with the hinged members of the shell or capsule represented in their opened relation, and showing in connection therewith, and in elevation, the arrangement of the combined cap-feeding and firing mechanism, the firing or exploding trigger being illustrated in its raised and spring-held position, ready to be released when the closed device is thrown into the air; and Fig. 4 is a transverse vertical section of the same, said section being represented as being taken on line 4—4 in said Fig. 3, said view, however, showing in connection therewith, the hinged members of the shell or capsule in their closed relation.

Fig. 5 is a view similar to Fig. 3, said view, however, showing the position of the firing or exploding trigger when the same has been released and while in the act of exploding a percussion cap.

Fig. 6 is a detail horizontal sectional representation of the device, said section be-

ing taken on line 6—6 in said Fig. 3; Fig. 7 is a similar sectional representation of the device said section being taken on line 7—7 in said Fig. 3; and Fig. 8 is a transverse vertical section of the device, said section being taken on line 8—8 in said Fig. 3, looking in the direction of the arrow Y.

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

Referring now to the several figures of the drawings, the reference-character 1 indicates a complete detonating toy made according to and embodying the principles of the present invention, the mechanism-inclosing shell or capsule comprising a pair of ornamental and suitably shaped shell or casing-members 2 and 3, hinged together or pivotally connected, as at 4, and respectively provided with an arrangement of snap-catches 5 and 6, for retaining the hinged shell or casing-member in their closed relation, and to provide a device having, in general, the appearance of a hand-grenade, as will be clearly evident from an inspection of Figs. 1 and 2 of the drawings.

At one end the said shell or casing-members 2 and 3 are respectively provided with semi-circular flange-like portions 7 and 8, said portions when the two members are closed forming an annular neck having an opening, as 9. Likewise, at the opposite end the said shell or casing-members 2 and 3 are respectively provided with extensions, as 10 and 11, the ends of said sections being respectively closed, as at 12 and 13, and slotted, as at 14 and 15, for the purposes to be presently more fully set forth.

The said shell or casing-member 3, at the proper locations, is provided with suitably formed lug-receiving slits 16, and fitted within said shell or casing-member 3 is a supporting plate or element 17 of any suitable marginal configuration and provided with marginal retaining lugs 18 which are inserted in said receiving slits 16 and may be bent over, or otherwise secured against the outer face-portions of the said shell or casing-member 3 for securing and maintaining the said supporting plate or element 17 in a positively fixed position, as will be clearly evident. The said supporting plate or element 17 is further provided along its marginal edge-portion 19 with a right-angled strip-support 20, over which the percussion-tape or strip is fed in the manner to be hereinafter set forth, said support being provided at one end with a downwardly curved receiving portion or lip 21 and with a marginal tape or strip-guide, as 22. At its other end, the said tape or strip-support 20 has an enlarged end, as 23, provided with oppositely located slits 24, one of which is always in registration with the marginal edge-portion of the flange-like portion 8 of the shell or casing-member 3, and the other slit 24 entering into registration with the marginal edge-portion of the flange-like portion 7 of the shell or casing-member 2 when the latter is brought into its closed relation with the shell or casing-member 3, so as to maintain the proper position of the said tape or strip-support 20, and to permit the same to serve as an exploding anvil and to withstand the shock of the descending trigger in the manner and for the purposes to be presently more fully described. In addition to the above-described features, the said supporting plate or element 17 has struck out therefrom, and bent at a right angle thereto, at a point suitably back of the curved receiving portion or lip 21 of the tape or strip-support 20, a suitably formed finger or post, as 25, upon which is adapted to be rotatably mounted a reel or wound percussion or paper-cap strip or tape 26, of the usual form, the reeled off end-portion 27 of said strip or tape being fed directly upon and over the upper surface of the tape or strip-support 20, as will be clearly understood from an inspection of the several figures of the drawings. To maintain the correct feeding relation between the reeled-off end-portion 27 of the strip or tape 26 and the upper surface of the support 20, a spring-retainer 28 having a curved contact-maintaining end 29 may be employed, said spring-retainer having its other end-portion 30 secured to the said supporting plate or element 17 by means of securing loops 31 struck out of said plate, as shown in Figs. 3 and 5 of the drawings, or the said spring-retainer may be secured to said plate or element 17 in any other suitable manner, as will be clearly evident.

The previously mentioned trigger which is preferably made from a single piece of sheet metal, is of the general configuration represented in Figs. 3, 4, 5, 6 and 7 of the drawings, and the same consists, essentially, of a striking member 32, adapted to be brought into forcible exploding contact with the cap properly fed and located upon the tape or strip-support 20, said member 32 being provided with a pair of upwardly and rearwardly extending side-members 33, said members being formed with downwardly extending members in the form of fingers, as 34, and each finger being provided with an elongated slot or opening 35, extending angularly in the directions represented more particularly in Figs. 3 and 5 of the drawings. The said side-members 33 are arranged in such a manner so as to provide a suitable space between them, and the trigger thus produced is pivotally mounted upon a pivot-pin or post 36, extending from the side of the said supporting plate or element 17, substantially as shown.

To maintain the trigger in its raised posi-

tion, the side-member 33, nearest the face of the plate or element 17, is provided with a hole 37, or other suitable means, with which is adapted to be forced into separable holding engagement, the suitably bent holding or retaining end 39 of a spring-post or finger 38 with which the said supporting plate or element 17 is provided. Encircling the shank of the pivot-pin or post 36, located between the two side-members 33, is a coiled spring 40, one extension 41 of which rests upon a lug or projection 42 extending from the edge of one of said side-members 33, and the other extension 43 of said spring being suitably bent, as at 44, said bent portion being arranged in retaining engagement over the marginal edge-portion 45 of the plate or element 17, in the manner shown in the several figures of the drawings.

One means for setting the trigger in its raised position, indicated in Figs. 3 and 4 of the drawings, or for releasing the same, so as to permit the said spring to forcibly lower the said trigger into the position represented in Fig. 5, so as to explode the cap, consists in the provision of a flat bar, as 46, one end of said bar extending into and through the alined slots 14 and 15 in the ends 12 and 13 of the extensions 10 and 11 of the respective shell or casing-members 2 and 3, the free end-portion of said bar 46 having a suitably bent and perforated member, as 47, to which is attached an end of a string 48 provided with a loop or ring 49 for slipping the same upon the finger of the operator. The opposite end-portion of said bar 46 which extends between the fingers 34 of the trigger, is provided with laterally extending lugs or projections, as 50, which extend into and are loosely disposed in the elongated slots or openings 35, for the purposes to be presently more fully described. The free end-portion 51 is preferably curved in a downward direction, as shown, and rests lightly upon the upper surface of the percussion or paper-cap strip or tape for intermittently feeding said tape or strip in the direction of the arrow Y, see Fig. 3 of the drawings, to thereby bring a fulminate forward into position to be exploded by the released trigger, as will be clearly understood from an inspection of Fig. 5 of the drawings.

Having in the foregoing description set forth the general construction of a detonating device embodying the principles of the present invention, I will now briefly set forth its manner of exploding a cap or fulminate.

Prior to arranging the reeled strip or tape of paper caps or fulminates in position upon the post or finger 25, the said bar 46 is pushed by the operator from the position indicated in Fig. 5, in the direction of the arrow Z, into the position represented more particularly in Fig. 3 of the drawings. This movement of the setting bar 46, causes the trigger to be raised and brought into held engagement with the holding or retaining end 39 of the spring-post or finger 38, as indicated in Figs. 3 and 4.

The hinged shell or casing-members 2 and 3 are now opened, and a reel 26 of paper caps or fulminates mounted in position upon said post or finger 25. The end-portion 27 of said reel 26 is now pulled forward and arranged beneath the maintaining end 29 of the spring-retainer 28, with a sufficient portion of the reeled-off part 27 resting directly upon the strip or tape-support 20, and with the unexploded cap or fulminate located in the proper position, shown in Figs. 3, 6 and 7, to be exploded by the descending trigger when the latter is released in the manner to be presently described. The two shell or casing-members 2 and 3 are now closed, and the loop or ring 49 of the string 48 placed upon the finger of the operator. The closed shell or casing is now taken in the hand and thrown into the air in the manner of throwing a ball. As shown, as the closed shell or casing reaches the end of its flight, determined by the length of the string, the sudden jerk causes the release of the trigger, whereby its spring 40 becomes active, and forces the striking member 32 of the trigger into exploding engagement with the properly located cap or fulminate, so as to fire the same with a loud detonation, as will be evident from an inspection of Fig. 5 of the drawings.

To reset the mechanism for the next detonation, the said bar 46 is again pushed in the direction of the arrow Z, in said Fig. 5, thereby once more bringing the trigger into its raised position, and simultaneously moving the curved end-portion 51 of said bar down upon and in contact with its end-portion 27 of the strip or tape 26, so as to move the next unexploded cap or fulminate into position to be exploded when the device is again thrown into the air.

Of course I am aware that changes may be made in the general arrangements and combinations of the several devices and parts, as well as in the details of the construction of the said parts, without departing from the scope of the present invention as set forth in the foregoing specification, and as defined in the clauses of the claims which are appended thereto. Hence, I do not limit my present invention to the exact arrangements and combinations of the several devices and parts as described in the said specification, nor do I confine myself to the exact details of the construction of the said parts, as illustrated in the accompanying drawings.

I claim:—

1. A detonating toy in the form of a hand-grenade, comprising a pair of hinged or piv-

otally connected shell-members secured to provide a casing, a supporting element in one of said shell-members, a repeating detonating mechanism mounted upon said supporting element, a combined setting and feeding means also mounted upon said supporting element, said means having a portion extending from said casing, and means attached to said extending portion for actuating said setting and feeding means and thereby releasing the detonating mechanism for action.

2. A detonating toy in the form of a hand-grenade, comprising a pair of hinged or pivotally connected shell-members secured to provide a casing, a supporting element in one of said shell-members, a repeating detonating mechanism mounted upon said supporting element, a combined setting and feeding means also mounted upon said supporting element, said means having a portion extending from said casing, and a string, provided with a finger-piece, attached to said extending portion for actuating said setting and feeding means and thereby releasing the detonating means for action.

3. A detonating toy in the form of a hand-grenade, comprising a pair of hinged or pivotally connected shell-members secured to provide a casing, a supporting element in one of said shell-members, a repeating detonating mechanism mounted upon said supporting element, comprising a tape or strip-support, a cap-exploding trigger, and a combined tape or strip-feeding and trigger-setting means also mounted upon said supporting element.

4. A detonating toy in the form of a hand-grenade, comprising a pair of hinged or pivotally connected shell-members secured to provide a casing, a supporting element in one of said shell-members, a repeating detonating mechanism mounted upon said supporting element, comprising a tape or strip-support, a cap-exploding trigger, a combined tape or strip-feeding and trigger-setting means, also mounted upon said supporting element, said means having a portion extending from said casing, and means attached to said extending portion for actuating said tape or strip-feeding and trigger-setting means to release said cap-exploding trigger.

5. A detonating toy in the form of a hand-grenade, comprising a pair of hinged or pivotally connected shell-members secured to provide a casing, a supporting element in one of said shell-members, a repeating detonating mechanism mounted upon said supporting element, comprising a tape or strip-support, a cap-exploding trigger, a combined tape or strip-feeding and trigger-setting means also mounted upon said supporting element, said means having a portion extending from said casing, and a string, provided with a finger-piece, attached to said extending portion for actuating said tape or string-feeding and trigger-setting means to release said cap-exploding trigger.

6. A detonating toy in the form of a hand-grenade, comprising a pair of separable shell-members secured to provide a casing, a repeating detonating mechanism within said casing comprising a main supporting element, a tape or strip-support extending angularly from said main supporting element, a cap-exploding trigger pivotally mounted upon said main supporting element, a tape or strip-engaging and feeding bar movably disposed within said casing, and means extending from said bar and connected with said trigger for setting the same.

7. A detonating toy in the form of a hand-grenade, comprising a pair of separable shell-members secured to provide a casing, a repeating detonating mechanism within said casing comprising a main supporting element, a tape or strip-support extending angularly from said main supporting element a cap-exploding trigger pivotally mounted upon said main supporting element, a tape or strip-engaging and feeding bar movably disposed within said casing, and means extending from said bar and connected with said trigger for setting the same, said bar having a portion extending from said casing, and means attached to said extending portion for actuating said bar to release said cap-exploding trigger.

8. A detonating toy in the form of a hand-grenade, comprising a pair of separable shell-members secured to provide a casing, a repeating detonating mechanism within said casing comprising a main supporting element, a tape or strip-support extending angularly from said main supporting element, a cap-exploding trigger pivotally mounted upon said main supporting element, a tape or strip-engaging and feeding bar movably disposed within said casing, and means extending from said bar and connected with said trigger for setting the same, said bar having a portion extending from said casing, and a string, provided with a finger-piece, attached to said extending portion for actuating said bar to release said cap-exploding trigger.

9. A detonating toy in the form of a hand-grenade, comprising a pair of separable shell-members secured to provide a casing, a repeating detonating mechanism within said casing comprising a main supporting element, a tape or strip-support extending angularly from said main supporting element, a spring-finger connected with said main-supporting element and having a trigger-engaging end-portion, a cap-exploding trigger pivotally mounted upon said main supporting element, said trigger comprising

a pair of side-members and a connecting striking member, one of said side-members being provided with means adapted to be brought into separable holding engagement with the trigger-engaging portion of said spring-finger for maintaining a raised relation of said trigger, a tape or strip-engaging and feeding bar movably disposed within said casing, and means extending from said bar and connected with said trigger for setting the same.

10. A detonating toy in the form of a hand-grenade, comprising a pair of separable shell-members secured to provide a casing, a repeating detonating mechanism within said casing comprising a main supporting element, a tape or strip-support extending angularly from said main supporting element, a spring-finger connected with said main supporting element and having a trigger-engaging end-portion, a cap-exploding trigger pivotally mounted upon said main supporting element, said trigger comprising a pair of side-members and a connecting striking member, one of said side-members being provided with means adapted to be brought into separable holding engagement with the trigger-engaging portion of said spring-finger for maintaining a raised relation of said trigger, a tape or strip-engaging and feeding bar movably disposed within said casing, and means extending from said bar and connected with said trigger for setting the same, said bar having a portion extending from said casing, and means attached to said extending portion for actuating said bar to release said cap-exploding trigger.

11. A detonating toy in the form of a hand-grenade, comprising a pair of separable shell-members secured to provide a casing, a repeating detonating mechanism within said casing comprising a main supporting element, a tape or strip-support extending angularly from said main supporting element, a spring-finger connected with said main-supporting element, and having a trigger-engaging end-portion, a cap-exploding trigger pivotally mounted upon said main supporting element, said trigger being pivotally mounted upon said main supporting element, said trigger comprising a pair of side-members and a connecting striking member, one of said side-members being provided with means adapted to be brought into separable holding engagement with the trigger-engaging portion of said spring-finger for maintaining a raised relation of said trigger, a tape or strip-engaging and feeding bar movably disposed within said casing, and means extending from said bar and connected with said trigger for setting the same, said bar having a portion extending from said casing, and means comprising a string, provided with a finger piece, attached to said extending portion for actuating said bar to release said cap-exploding trigger.

12. A detonating toy in the form of a hand-grenade, comprising a pair of separable shell-members secured to provide a casing, a repeating detonating mechanism within said casing comprising a main supporting element, a tape or strip-support extending angularly from said main supporting element, a spring-finger connected with said main supporting element and having a trigger-engaging end-portion, a cap-exploding trigger pivotally mounted upon said main supporting element, said trigger comprising a pair of side-members and a connecting striking member, one of said side-members being provided with means adapted to be brought into separable holding engagement with the trigger-engaging portion of said spring-finger for maintaining a raised relation of said trigger, and said side-members being further provided with oppositely placed elongated openings, a tape or strip engaging and feeding bar movably disposed within said casing, said bar having a portion located between the side-members of said trigger, and lugs extending from the side-edges of said bar and into said elongated openings of the side-members of the trigger for setting said trigger.

13. A detonating toy in the form of a hand-grenade, comprising a pair of separable shell-members secured to provide a casing, a repeating detonating mechanism within said casing comprising a main supporting element, a tape or strip-support extending angularly from said main supporting element, a spring-finger connected with said main supporting element and having a trigger-engaging end-portion, a cap-exploding trigger pivotally mounted upon said main supporting element, said trigger comprising a pair of side-members and a connecting striking member, one of said side-members being provided with means adapted to be brought into separable holding engagement with the trigger-engaging portion of said spring-finger for maintaining a raised relation of said trigger, and said side-members being further provided with oppositely placed elongated openings, a tape or strip engaging and feeding bar movably disposed within said casing, said bar having a portion located between the side-members of said trigger, and lugs extending from the side-edges of said bar and into said elongated openings of the side-members of the trigger for setting said trigger, said bar having a portion extending from said casing, and means attached to said extending portion for actuating said bar to release said cap-exploding trigger.

14. A detonating toy in the form of a hand-grenade, comprising a pair of separable shell-members secured to provide a

casing, a repeating detonating mechanism within said casing comprising a main supporting element, a tape or strip-support extending angularly from said main supporting element, a spring-finger connected with said main supporting element and having a trigger-engaging end-portion, a cap-exploding trigger pivotally mounted upon said main supporting element, said trigger comprising a pair of side-members and a connecting striking member, one of said side-members being provided with means adapted to be brought into separable holding engagement with the trigger-engaging portion of said spring-finger for maintaining a raised relation of said trigger, and said side-members being further provided with oppositely placed elongated openings, a tape or strip engaging and feeding bar movably disposed within said casing, said bar having a portion located between the side-members of said trigger, and lugs extending from the side-edges of said bar and into said elongated openings of the side-members of the trigger for setting said trigger, said bar having a portion extending from said casing and a string, provided with a finger-piece, attached to said extending portion for actuating said bar to release said cap-exploding trigger.

In testimony that I claim the invention set forth above I have hereunto set my hand this 29th day of April, 1920.

CHARLES HOFER.

Witnesses:
FREDK. C. FRAENTZEL,
BARBARA W. SUTTERLIN.