June 26, 1928. 1,675,118

O. D. LUCAS

PERCUSSION FIRING MECHANISM

Filed Oct. 11, 1926

Fig. 1.

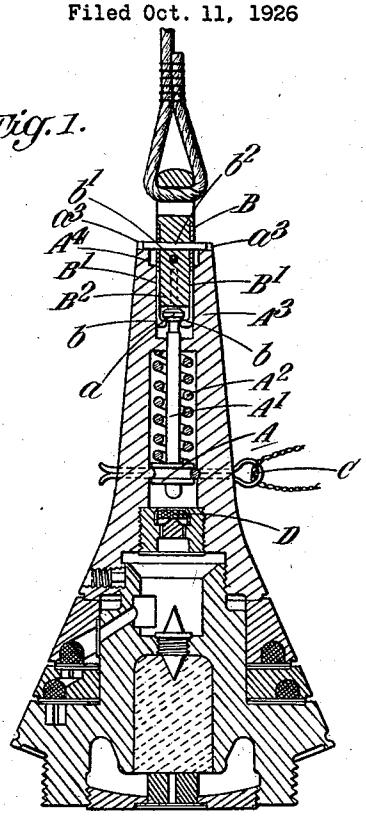


Fig. 2.

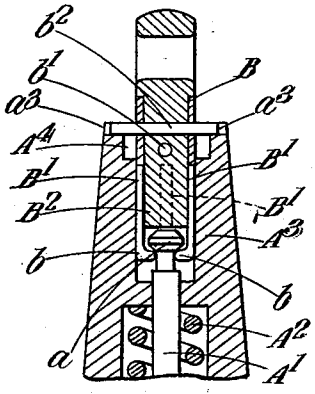
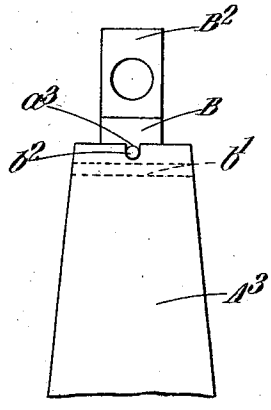


Fig. 3.



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UNITED STATES PATENT OFFICE.

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PERCUSSION FIRING MECHANISM.

Application filed October 11, 1926, Serial No. 140,701, and in Great Britain October 22, 1925.

This invention relates to percussion firing mechanism of the kind having a spring actuated striker or firing pin which, after being retracted and released, is forced by its spring into contact with a percussion cap or primer to effect detonation. The improvided firing mechanism is particularly applicable to flare, smoke or signal bombs which are dropped from air craft and in which the firing mechanism is operated by the act of dropping the bomb.

According to the present invention the spring of the striker or firing pin is normally in an unstressed condition and the striker is retracted against the action of this spring by an axially movable member having spring hooks, claws, or the like which engage with part of the striker and are held in engagement therewith by contact with the inner surface of a sleeve wherein the striker and the said member are disposed but which, when the striker has been retracted to a predetermined extent, come opposite a recess in the sleeve so that they are free to move aside to release the striker which is then impelled by its spring on to the percussion cap or primer; the blow given by the striker is thus constant irrespective of the speed or force with which the striker is retracted since the point of release of the striker is determined only by the amount of retraction necessary to bring the spring hooks or claws opposite the recess in the sleeve.

The aforesaid axially movable member may comprise a tube which is formed with a number of longitudinal slits or saw-cuts to provide spring fingers whose ends are bent inwards to constitute the aforesaid spring hooks or claws and this tube may be filled with a metal plug through which and through the tube and also through the sleeve, a shearing wire or pin passes. The ends of the hooks or claws may be rounded somewhat and may bear against a slightly rounded shoulder formed by a circumferential groove at the end of the striker stem, so that the spring of the striker assists in moving the said hooks or claws aside to release the striker as aforesaid.

A guide pin may pass transversely through the tube and through the plug and its outer ends may engage in longitudinal slots or recesses in the outer end of the sleeve, this arrangement facilitating the assembly of the shearing wire or pin and also preventing liability of the latter becoming sheared by forcible turning of the tube about its axis.

In order that the said invention may be clearly understood and readily carried into effect, the same will now be described more fully with reference to the accompanying drawings, in which:—

Figure 1 is an axial section showing the fuze of a smoke or signal bomb for aircraft, this fuze having firing mechanism constructed in accordance with this invention.

Figure 2 is an enlarged view of the upper part of Figure 1, and

Figure 3 is a side elevation of Figure 2.

A is the striker head, A^1 is the striker stem and A^2 is the striker spring interposed between the head A^1 and the sleeve or casing A^3 which is screwed on to the fuze body and in which the striker is arranged, this spring being normally in the unstressed condition. B is the aforesaid tube which is slidably mounted in the upper or outer end of the sleeve A^3 and is formed with a number of longitudinal slits to provide spring fingers B^1 having hooked ends b which normally engage beneath a shoulder a formed by a circumferential groove on the outer end of the striker stem, the hooked ends and the shoulder being slightly rounded as shown in Figure 2. The tube B is filled with a metal plug B^2 and a shearing pin or wire b^1 passes through the tube, the plug and the sleeve A^3. A guide pin b^2 also passes through the tube B and the plug B^2 and its projecting ends engage in slots or recesses a^3, a^3 in the outer end of the sleeve A^3 so as to facilitate the assembly of the shearing pin or wire b^1 and prevent the latter from being sheared by angular movement of the tube about its axis. The outer end of the sleeve A^3 is formed with an internal annular recess A^4 to receive the hooked ends b of the spring fingers B^1 when they come opposite the said recess. A safety pin C passing through the sleeve A^3 and a circumferential recess in the striker head A, normally prevents movement of the striker from taking place.

In operation, the safety pin C is removed and a pull is exerted upon the tube B to move the latter outwardly, thereby shearing the pin or wire b^1, retracting the striker against the resistance of the spring A^2 and bringing the lower hooked ends b of the

spring fingers B^1 opposite the annular recess A^4 in the sleeve A^3. The spring fingers then move laterally out of engagement with the shoulder *a*, the rounded formation of this shoulder and of the hooked ends of the spring fingers enabling the spring A^2 to assist in moving the said fingers aside. The striker is thereby released and is impelled by its spring A^2 on to the percussion cap D of the fuze. The tube B with its plug B^2 and the spring fingers B^1 become completely separated from the sleeve A^3 when the striker is liberated. In the case of a smoke or signal bomb to be dropped from aircraft (which is what is illustrated in the accompanying drawings) the plug B^2 is attached to part of the aircraft by a lanyard or link so that when the bomb is dropped its weight affects the retraction of the striker and its release as aforesaid.

What I claim and desire to secure by Letters Patent of the United States is:—

1. Percussion firing mechanism comprising in combination a striker or firing pin, a percussion cap, a spring for moving said striker to explode said percussion cap, said spring being normally in an unstressed condition, an axially movable tube formed with a number of longitudinal slits to provide spring fingers, inwardly bent portions of said spring fingers constituting hooks, a rounded projection on the striker with which said hooks engage, a sleeve against the inner surface of which said spring fingers bear to hold the hooks in engagement with the rounded projection on the striker, and a recess in said sleeve into which said spring fingers move at a certain point in the travel of the axial movable tube so that the hooks become disengaged from the said rounded projection and the striker is then impelled on to the percussion cap by this spring.

2. In percussion firing mechanism, the combination with the elements claimed in claim 1, of a metal plug which fills the tube, and a shearing wire passing through the tube, the metal plug and the sleeve surrounding the spring fingers.

3. In percussion firing mechanism, the combination with the elements claimed in claim 1, of a metal plug which fills the tube, a shearing wire passing through the tube, the metal plug and the sleeve surrounding the spring fingers, a guide pin which passes through the tube and through said plug and the outer ends of which engage in longitudinal recesses in the outer end of said sleeve.

4. In percussion firing mechanism for use with a smoke or signal bomb to be dropped from aircraft, the combination with the elements claimed in claim 1, of means at the outer end of the axially movable tube for attaching to part of the aircraft by a flexible connecting device so that when the bomb is dropped its weight effects the retraction of the striker.

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