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SAFETY FOR A FIREARM HAMMER MECHANISM

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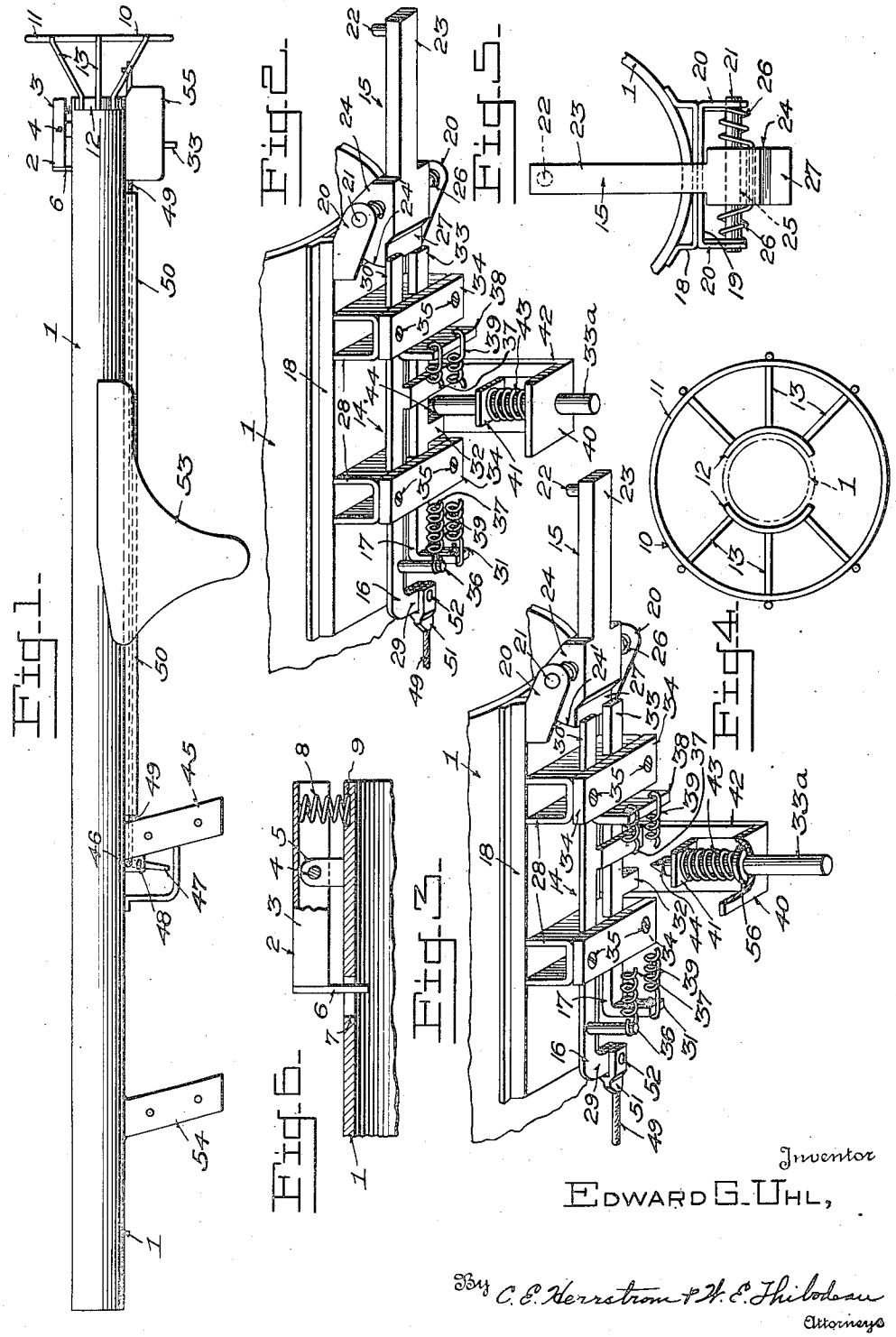

Fig. 1.

Fig. 2.

Fig. 3.

Fig. 4.

Fig. 5.

Fig. 6.

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SAFETY FOR A FIREARM HAMMER MECHANISM

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4 Claims. (Cl. 42—70)

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The invention described herein may be manufactured and used by or for the Government for governmental purposes without the payment to me of any royalty thereon.

This invention relates to a rocket projector and particularly to a percussion fired rocket projector.

It is a particular object of this invention to provide a rocket projector having a semi-automatic percussion firing mechanism to effect the discharge of a rocket from the rocket projector.

A particular object of this invention is to provide a hammer mechanism for a rocket projectile which may be cocked either manually or by the gas blast of a discharged rocket.

Another object of this invention is to provide a rocket projector that is light and compact which may be readily carried by a single individual.

The specific nature of the invention as well as other objects and advantages thereof will clearly appear from a description of a preferred embodiment as shown in the accompanying drawings in which:

Fig. 1 is a side elevational view of the rocket projector.

Fig. 2 is an enlarged detail perspective view of the firing mechanism shown in the cocked position ready to fire.

Fig. 3 is a view similar to Fig. 2 showing the firing mechanism cocked but with the safety engaged.

Fig. 4 is an end view of the guard ring.

Fig. 5 is a fragmentary detail view showing the hammer in the raised or fired position.

Fig. 6 is a detail view partly in longitudinal section of the rocket projectile catch.

The rocket projector, as illustrated in the accompanying drawings, comprises mainly a long tube-like barrel in which a rocket projectile (not shown) may be inserted. A percussion firing mechanism is mounted on the underside of the tube for firing the rocket projectile and is arranged to be released by a trigger which is connected to such firing mechanism by a cable. A shoulder stock and fore grip are also dependingly mounted on the tube to facilitate holding the projector while aiming and firing.

The projector comprises a long tube 1, preferably of sufficient length that the rocket propellant charge of the rocket projectile is completely burned before such projectile leaves the muzzle of the tube. A positioning catch 2 is provided to properly position and secure the rocket projectile (not shown) within tube 1. The catch 2 (Figs. 1 and 6) comprises a lever 3 which is

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pivotally mounted by a transverse pin 4 in a bracket 5 welded to the top of tube 1 near the right end thereof as viewed in Fig. 1. An integral downwardly projecting arm 6 is provided on left end of lever 3 as shown in Fig. 6 which projects down thru a hole 7 provided in the top of tube 1. A spring 8 is placed between the rear end of lever 3 and tube 1 to bias the arm 6 into engagement with an inserted rocket projectile (not shown). Spring 8 rests in a recess 9 provided on top of tube 1.

To facilitate loading a rocket projectile into the rear end of tube 1 and to prevent accidental closure of the rear end of tube 1 by abutting against other objects, a funnel shaped guide ring 10 is mounted on the extreme end of tube 1. Guide ring 10 comprises a large ring 11 (Fig. 4) and a smaller split ring 12 connected together by spokes 13. The spokes 13 are preferably welded to rings 11 and 12 and are evenly spaced about the periphery thereof.

A percussion firing mechanism 14 (Figs. 2 and 3) comprising mainly a hammer 15, a sear 16 and a safety 17 is mounted on the underside of tube 1 at the rear end thereof to effect discharge of the rocket projector. A base 18 is welded to the underside of tube 1 to mount the elements of the firing mechanism 14. A bracket, as more clearly illustrated in Fig. 5, is mounted on the extreme rear edge of base 18 to mount a hammer 15. Bracket 19 is provided with two downwardly projecting lugs 20 on which is supported a transverse pin 21. Hammer 15 comprises a firing pin 22, arm 23, and an integral hub 24 on one end of arm 23. The pin 22 is brazed or otherwise secured to the other end of arm 23. A transverse hole 25 is provided in the hub 24 so that hammer 15 may be pivotally mounted on pin 21. Two torsion springs 26 are mounted on pin 21, one on each side of hub 24 of hammer 15 to centrally locate hammer 15 on pin 21 and to bias hammer 15 into an upright position as shown in Fig. 5 so that the firing pin 22 can strike the primer of the rocket projectile (not shown). On the underside of hub 24 as shown in Fig. 2 there is provided a flat recessed sear surface 27 which is engaged by the sear 16 and the safety 17. An accurate cam surface 24' is formed on the end of hub 24 for a purpose to be described.

Sear 16 and safety 17 are supported on the underside of base 18 by two U-shaped brackets 28 welded to base 18. Sear 16 is a long rectangular member provided with an integral lug 29 on the left end thereof as viewed in Figs. 2 and 3. The sear 16 is longitudinally mounted in suitably

shaped notches in the base of the brackets 28. The other end 30 of sear 16 engages under the sear surface 27 of hammer 15 when hammer 15 is lowered to the position shown in Fig. 2. Safety 17 is also a long rectangular member and similarly mounted in brackets 28 parallel to sear 16. The safety 17 is substantially thicker than sear 16 and the left end is bent downwardly as viewed in Fig. 2 to form a depending arm 31. An integral lug 32 is provided approximately in the center of safety 17 to be engaged by a safety actuating plunger 33 to be described. The right end 33 of safety 17 can also engage under sear surface 27 when the hammer 15 is in the lowered position as shown in Fig. 2.

Sear 16 and safety 17 are each retained within their respective notches in brackets 28 by straps 34 secured to the underside of each bracket 28 as by the screws 35.

A vertical pin 36 is secured to sear 16 near lug 29 and one end of a sear spring 37 is mounted on pin 36. The other end of sear spring 37 is secured to a downwardly projecting bracket 38 which is welded to the side of right hand strap 34 as shown in Fig. 2. One end of a safety spring 39 is mounted on the end of the downwardly projecting arm 31 of safety 17 while the other end is secured to the bracket 38. The springs 37 and 39 respectively bias the sear 16 and safety 17 to the right so that their ends engage under sear surface 27 of hammer 15. As the bottoms of sear 16 and safety 17 lie in the same plane, as shown in Figs. 2 and 3, the safety 17, being thicker than sear 16, will project upwardly higher and hence engage sear surface 27 before sear 16. Hammer 15 will then be held in the cocked position by safety 17 until such safety is disengaged from surface 27 by a plunger 33*a*.

A plunger 33*a* is provided to disengage safety 17 from sear surface 27 of hammer 15 to permit sear 16 to become operative. The plunger 33*a* is vertically mounted between two integral lugs 40 and 41 of a depending bracket 42 welded to base 18 between the two brackets 28. A collar 56 is permanently secured to plunger 33*a* and rests against the upper surface of lug 40. A helical spring 43 surrounds plunger 33*a* between the lug 41 and collar 56 to bias plunger 33*a* downwardly. Plunger 33*a* is provided with a conical shaped end 44 which, when safety plunger 33*a* is manually moved upwardly, will engage the side of lug 32 on safety 17 and thus withdraw safety 17 from sear surface 27 to ready hammer 15 for firing as will be described in more detail later.

A cover 55 (Fig. 1) is provided to shield firing mechanism 14 from injury due to dirt or chance blows. The cover 55 is preferably mounted in such manner as to be readily removable.

A pistol grip 45 is secured as by welding to the underside of tube 1 approximately in the center thereof. A bifurcated depending lug 46 is provided in the upper forward portion of pistol grip 45 adjacent barrel tube 1. A trigger 47 is pivotally mounted on lug 46 by a transverse pin 48. Trigger 47 is so mounted that a portion of the trigger extends above transverse pin 48. A connection is made between trigger 48 and sear 16 by a cable 49. Cable 49 is suitably secured to the upper end of trigger 47 and passes thru a suitable hole in pistol grip 45 into a cable housing 50 welded to the under side of tube 1. The other end of cable 49 connects with lug 29 of sear 16 by means of a clevis 51. The clevis 51 is pivotally mounted on lug 29 by a pin 52.

A shoulder stock 53 is dependingly mounted on tube 1 in the rear of pistol grip 45. A fore grip 54 is welded or otherwise secured to the other under side of tube 1 somewhat ahead of pistol grip 45 as shown in Fig. 1.

To operate the projector, it is necessary that hammer 15 be cocked prior to insertion of the rocket projectile into tube 1. Hammer 15 is readily cocked by grasping arm 23 and pivoting hammer 15 against the bias of torsion springs 26 to the position shown in Fig. 3. During this pivotal movement, the arcuate surface 24' of hammer 15 cams the sear 16 and safety 17 to the left, as viewed in Figs. 2 and 3, until the hammer reaches a position where sear surface 27 clears both sear 16 and safety 17, whereupon sear 16 and safety 17 snap rearwardly under the force of springs 37 and 39 respectively to engage under sear surface 27. Since safety 17 is thicker than sear 16 and since the bottom of sear 16 and safety 17 are on the same plane as previously mentioned, sear 16 will underlie but not engage the sear surface 27 when safety 17 fully engages under sear surface 27.

The rocket projector is readily loaded by inserting a rocket projectile (not shown) into the rear of tube 1 thru the ring 10. The rocket projectile is properly positioned within tube 1 by engagement of arm 6 of catch 2 in an annular locating groove provided on the rocket projectile (not shown).

The hammer 15 is shown in the safe position in Fig. 3. As shown thus safety 17 is in engagement with surface 27 of hammer 15. To disengage safety 17 from surface 27 plunger 33*a* is pushed upwardly. The conical end surface 44 of plunger 33*a* strikes lug 32 of safety 17 and forces safety 17 to the left as shown in Fig. 2. Thus the end 33 of safety 17 becomes disengaged from surface 27 and the hammer pivots counterclockwise a slight amount so that sear 16 now engages sear surface 27 and holds hammer 15 in the ready-to-fire position as shown in Fig. 2. The plunger 33*a* can now be released without returning safety 17 into engagement with sear surface 27 as safety 17 now will abut against arcuate surface 24'. The hammer 15 may now be released by sear 16. Sear 16 is released when trigger 47 is pulled rearwardly. The trigger 47 pulls cable 49 which in turn causes sear 16 to slip off sear surface 27 against the bias of spring 37.

Immediately as the sear 16 slips off surface 27 the torsion springs 26 bias hammer 15 upwardly and firing pin 22 strikes the primer of the rocket projectile (not shown). Safety 17 slides against arcuate surface 24' as hammer 15 pivots upwardly to the fired position. The gas blast resulting from the discharge of the projectile impinges on hammer 15 and strikes it with such force as to pivot it to its cocked position shown in Fig. 3 where safety 17 will again engage under sear surface 27. Sear 16 returns to position under surface 27 when the trigger is released. It is apparent that the portion of the hammer exposed to the gas blast should have a substantial area to insure the cocking of the hammer by the gas blast.

From the foregoing description it is readily apparent that a rocket projector of simple, light, and compact construction is provided. It is also apparent that a simple dependable firing mechanism is provided which can be cocked by the

discharge of a projectile. The mechanism is particularly advantageous for two man firing of the projector, i. e., one man aiming and firing and the other loading projectile into the rear end of the projector. By providing safety actuating plunger **33** at the rear of the projector it can be conveniently operated by only the loader and hence serves to insure that the loader is not in the path of the gas blast when the projectile is fired.

It will be noted that if safety plunger **33***a* is actuated and then released, the firing mechanism is self-cocking regardless of the position of the trigger. The hammer **15**, being pivoted to cocked position by the gas blast of a discharged rocket is engaged and held in such position by safety **17**.

I claim:

1. A hammer mechanism for a firearm comprising a pivotally mounted hammer, resilient means biasing said hammer, a sear surface on said hammer, a slidably mounted safety member, said safety member arranged to engage the sear surface of said hammer to hold said hammer in a cocked position against the bias of said resilient means, means for sliding said safety member out of engagement with the sear surface, a slidably mounted sear, said sear arranged to engage the sear surface of said hammer to hold said hammer in a cocked position against the bias of said resilient means and trigger means for sliding said sear out of engagement with sear surface of said hammer.

2. A hammer mechanism as in claim 1 wherein the means for sliding the safety member comprises a spring pressed plunger, a cam surface on the end of said plunger, and a lug on said safety member, said plunger being arranged with respect to said lug so that said cam surface engages said lug to slide said safety member upon actuation of said plunger.

3. A hammer mechanism for a firearm comprising a frame, a hammer pivotally mounted on said frame, resilient means exerting a torsional bias on said hammer, said hammer comprising a striker arm and an integral hub portion, a sear surface on said hub portion, a cam surface on said hub portion adjacent said sear surface, a sear slidably mounted in said frame, resilient means biasing said sear into engagement with said hub, said sear arranged to engage said cam surface of said hub in the non-cocked position of said hammer and to engage said sear surface of said hub to hold said hammer in a cocked position against the bias of said resilient means, trigger means for sliding said sear out of engagement with the sear surface of said hammer, a safety member slidably mounted in said frame, resilient means biasing said safety member into engagement with said hub, said safety member arranged to engage the sear surface of said hub in the cocked position of said hammer and to engage the cam portion of said hub in the non-cocked position of said hammer, and means for sliding said safety member out of engagement with said sear surface of the hammer.

4. A hammer mechanism as in claim 3 wherein the last mentioned means comprises a spring pressed plunger, a cam surface on the end of said plunger and a lug on said safety member, said plunger being arranged with respect to said lug so that said cam surface engages said lug to slide said safety member upon actuation of said plunger.

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