

Sept. 28, 1965

P. V. CHOATE

3,208,347

## ROCKET LAUNCHERS AND REAR SIGHT THEREFOR

Original Filed May 24, 1963

3 Sheets-Sheet 1

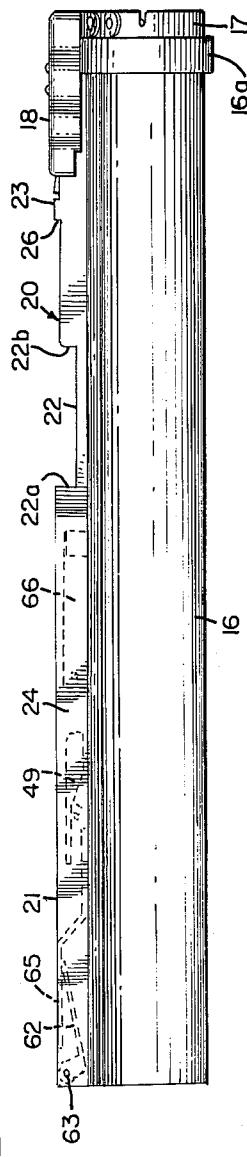
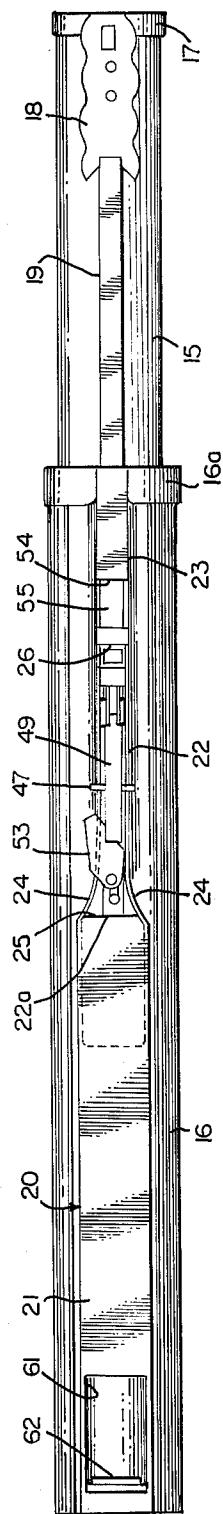
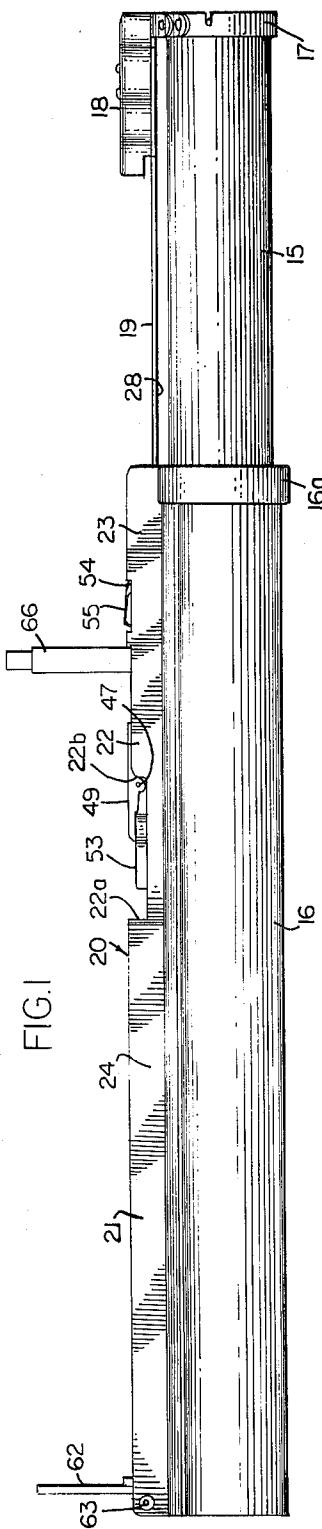


FIG. 3

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## ROCKET LAUNCHERS AND REAR SIGHT THEREFOR

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3 Sheets-Sheet 2

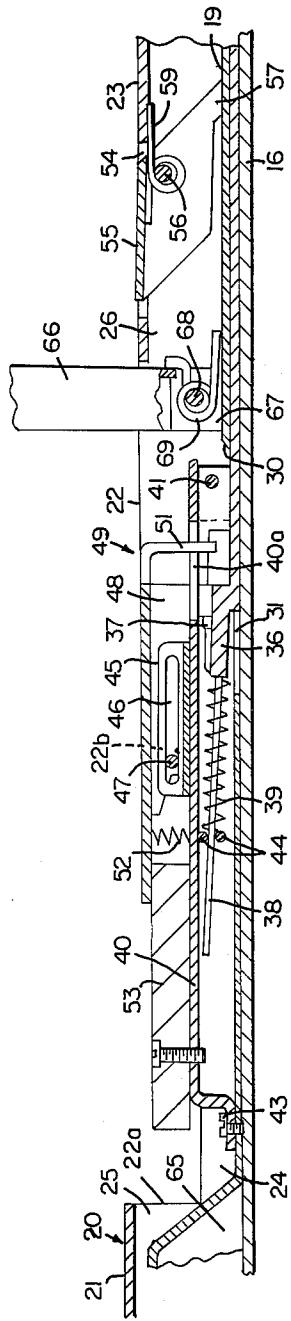
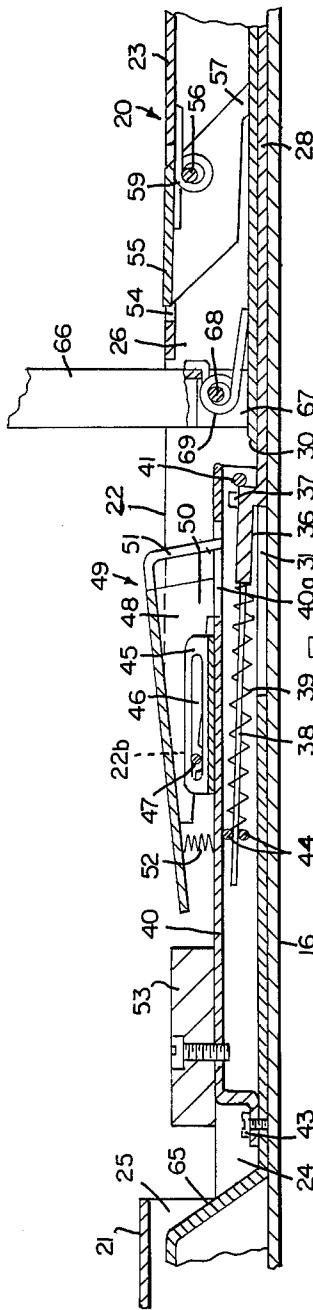
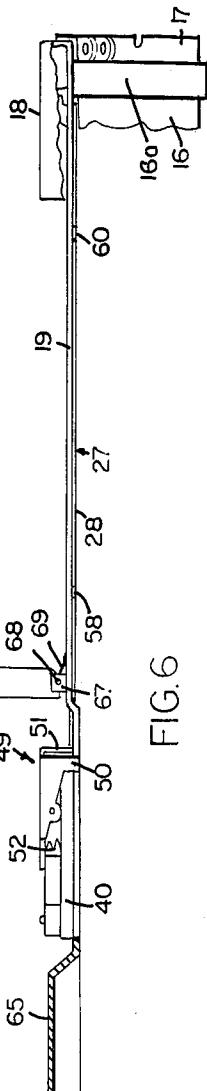


FIG. 4



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FIG.



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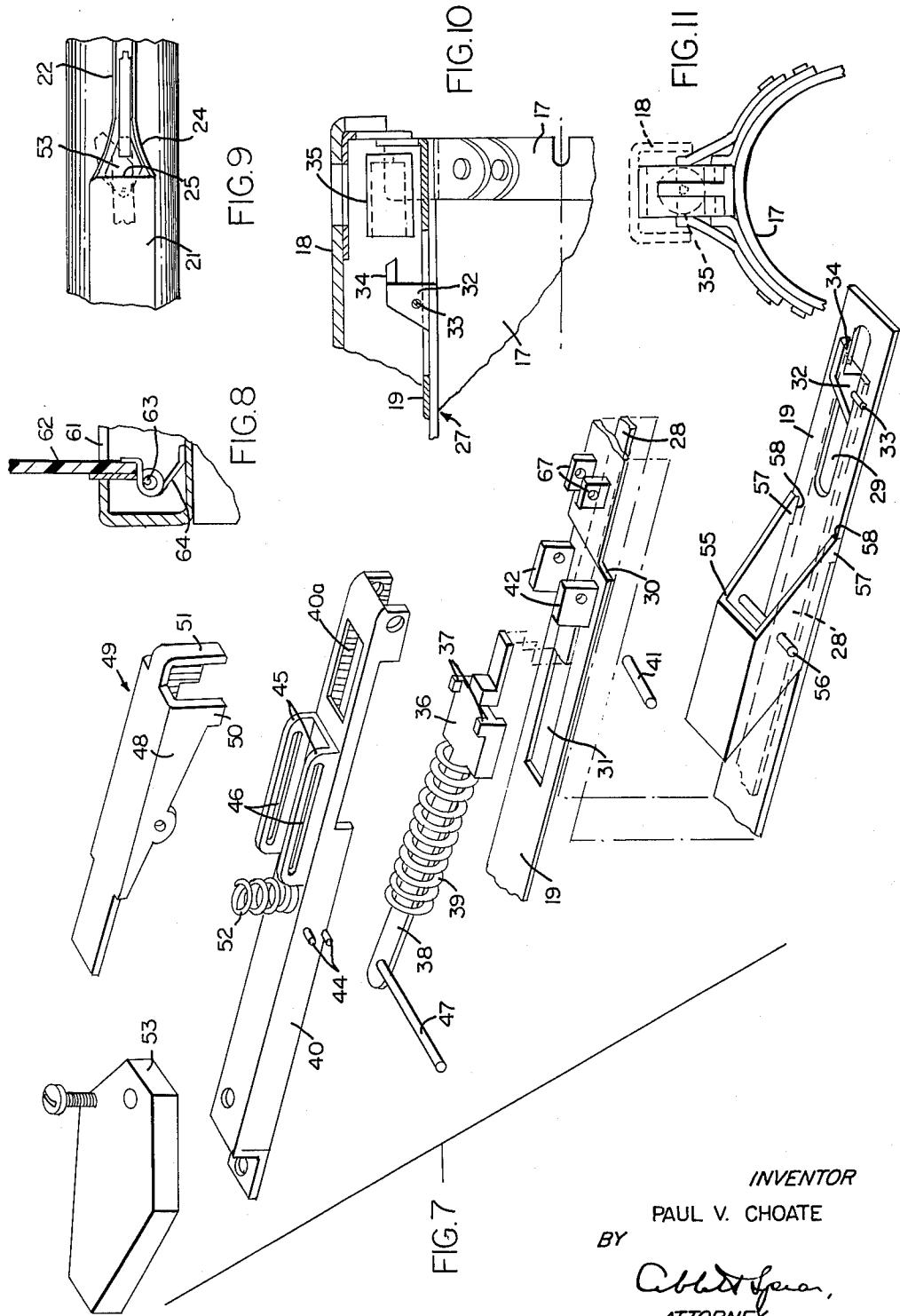
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## ROCKET LAUNCHERS AND REAR SIGHT THEREFOR

Original Filed May 24, 1963

3 Sheets-Sheet 3



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## ROCKET LAUNCHERS AND REAR SIGHT THEREFOR

Paul V. Choate, Milton, Mass., assignor, by mesne assignments, to Norris Thermador Corporation, Los Angeles, Calif., a corporation of California  
Original application May 24, 1963, Ser. No. 282,902.  
Divided and this application Dec. 21, 1964, Ser. No. 419,890

2 Claims. (Cl. 89—1.7)

The present invention relates to rocket launchers and is a divisional application of the co-pending application of Paul V. Choate, Serial No. 282,902, filed May 24, 1963, of the type disclosed in United States Letters Patent No. 3,122,059, dated November 1, 1963.

Such launchers are of the type having first and second tubular sections telescopingly connected to enable the launchers to be extended from a shortened inoperative position into an elongated, operative position. One end of the first section is the breech end of the launcher and the first section slidably fits within the second section. In practice, a rocket is carried within the first section and the launcher is readied for use by extending it into its operative position and then releasing the safety.

Such rocket launchers have proved to be satisfactory and the present invention is concerned with launchers of the above generally indicated type that are simpler in construction, safer and easier to operate, and that can be manufactured even more economically.

In practice, the firing spring of a launcher of the type under consideration is not placed under tension until the launcher has been so extended that but further short relative movement between the sections is required to establish the operative launcher position. During such short relative movement, the firing spring becomes tensioned, provided the launcher is locked in its operative position without which locking, the firing spring is operative to draw the launcher sections towards each other to an extent sufficient to render the firing pin ineffective should the trigger then be actuated.

In accordance with the present invention, the objective of increased safety and reliability of the firing means is attained by providing the first section with a first rigid member overlying the second section and having a portion automatically but releasably engaged by a lock carried by the second section when the launcher is fully extended thus to releasably hold the launcher in its operative position. The first member may also have a second portion, spaced from its first portion, to be automatically but releasably engaged by the lock when the launcher is in its shortened, inoperative position.

The firing means includes a second rigid member which is the firing member and is movable relative to the first section between a rearward firing position and a forward cocked position with the firing spring being tensioned by movement of the firing member into its cocked position. The two members move together relative to the second launcher section except during the short further relative movement required to establish the operative launcher position after it has been almost but not quite fully extended and, during such short further movement, the second or firing member is releasably connected to the second launcher section, a result attained by providing a trigger to which the firing pin is releasably connected and which is slidably connected to the first member and engageable with the second launcher section during the short relative movement of the section in which the firing spring becomes tensioned.

Launchers of the type with which the invention is concerned have sights that are inoperatively positioned until the launcher is extended into its operative position. The

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sights are pivoted to swing, under the influence of erecting springs, from their inoperative positions parallel to the launcher axis into positions at right angles thereto.

Another objective of the present invention is to provide a housing on the second launcher section for the first member, for the front sight, and for the rearsight with the front sight being pivotably supported by the second section and held in its inoperative position by the front portion of the first member and with the rear sight being pivotably supported by the first member thus to be freed on relative movement of the sections in extending the launcher. The housing port through which the front sight erects itself is preferably closed by the front portion of the first member when the launcher is in its inoperative position.

Another objective of the present invention is to have the trigger and safety also carried by the first member within the housing with the safety always becoming operative on the telescoping of the sections to establish the inoperative position of the launcher.

In the accompanying drawings, there is shown an illustrative embodiment of the invention from which these and other of its objectives, novel features, and advantages will be apparent.

25 In the drawings:

FIGURE 1 is a side elevation of a rocket launcher in its extended operative position,

FIGURE 2 is a top elevational view thereof,

FIGURE 3 is a side elevation of the launcher in its shortened inoperative position,

FIGURE 4 is a fragmentary and partly sectioned view, on an increased scale, of certain of the parts when the launcher is cocked,

FIGURE 5 is a like view showing the same parts after 35 firing,

FIGURE 6 is a fragmentary view of the first launcher section showing the first rigid member and the elements carried thereby,

FIGURE 7 is an exploded, perspective view of the trigger and portions of the first and second rigid members,

FIGURE 8 is a fragmentary vertical section of the front part of the second launcher section and the front sight,

45 FIGURE 9 is a fragmentary top elevational view illustrating the re-entry of the safety into the housing of the second launcher section as the launcher sections are being telescoped to re-establish the inoperative launcher position,

FIGURE 10 is a fragmentary and partly sectioned view of the breech end of the first launcher section, and

55 FIGURE 11 is a fragmentary breech end view thereof. The launcher shown in the drawings consists of a first or rear tubular section 15 dimensioned to fit slidably within a second or front section 16. The rear section 15 has an annular stop 17 at its rear or breech end supporting a forwardly extending housing 18 which is parallel to but spaced from the rear section 15 to enable the collar 16A on the rear end of the second section 16 to seat against the stop 17 when the sections are telescoped together to establish the inoperative, shortened launcher position illustrated by FIGURE 3. Secured to the under surface of the housing 18 is a rigid member in the form of a flat-surfaced rod 19 overlying the launcher section 16 and extending within a generally indicated housing 20 extending lengthwise of the exterior of the launcher section 16 and defining the sight line of the launcher.

60 The housing 20 includes a front portion 21, an intermediate open portion 22, and a rear portion 23. The side walls 24 of the housing 20 taper inwardly at the junction of the portions 21 and 22 with the portions 22 and 23 be-

ing of the same width but narrower than the housing portion 21. In the forward part of the intermediate portion 22, the height of the side walls 24 is decreased to provide forward and rearward shoulders 22A and 22B, respectively. The shoulders 22A flank the port 25, of the housing portion 21. The port of the housing portion 23 is indicated at 26.

A firing member is generally indicated at 27 in FIGURE 6 and includes a flat-surfaced rod 28 somewhat narrower than and underlying the rod 19, see FIGURES 4, 5, and 7. The rod 19 has a slot 29 adjacent its rear end and a forwardly located shoulder 30 at the rear end of a slot 31, the shoulder 30 and the slot 31 being within the housing portion 21 in the inoperative position of the launcher. At the rear of the rod 28 there is a slide 32 extending upwardly through the slot 29 and slidably supported therein by a transverse pin 33. The slide 32 includes an integral firing pin 34 for igniting a cap (not shown) of a projectile igniter, the cap being within the cap chamber 35 mounted within the housing 18. At its forward end the rod 28 is connected, through the slot 31 to a slide 36 supported by the upper surface of the rod 19. The slide 36 includes a pair of transversely spaced sears 37 and a forwardly disposed pin 38 supporting a coiled firing spring 39.

A trigger mount 40 is attached to the rod 19 by means of a pin 41 extending transversely through it and through upstanding ears 42 with which the rod 19 is provided adjacent the shoulder 30 and by a screw 43 at its front end. The trigger mount 40 has a pair of vertically spaced, transverse pins 44 slidably receiving the pin 38 and operative to compress the firing spring 39 on movement of the rod 19 rearwardly relative to the firing member 27.

The mount 40 has marginal, upstanding flanges 45 having lengthwise slots 46 to receive a transverse pin 47 extending through the sides 48 of a trigger 49. The trigger has rearward sear engaging members 50 and a stop 51 which extends downward, as a safety, through a slot 40A into the path of the slide 36. The trigger 49 is thus mounted both to slide and to be pivoted relative to its mount 40 and it is yieldably held in a sear engaging position by a spring 52 interposed between the mount 40 and the trigger 49 forwardly of the connection therebetween. The mount 40 also supports a rotatable safety 53 which is adapted to be turned from a position underlying the forward end of the trigger and preventing its actuation, see FIGURE 4, into a position in which the trigger is unblocked, see FIGURE 5. By reference to FIGURE 9, it will be noted that the safety 53 is dimensioned to pass through the port 25 only in its operative or safe position and that the safety 53 is so shaped that if the launcher is telescoped into its inoperative position in an unsafe condition, the safety 53 is cammed into its operative position as it enters the port 25.

In practice, the trigger is within the housing portion 21 in the inoperative position of the launcher, the firing spring is uncompressed, but the trigger 49 and the slide 36 of the firing member 27 are in engagement. As the launcher is extended, the members 19 and 29 move as a unit relatively to the front section 16 with the trigger 49 entering the intermediate section 22. It will be noted, see FIGURE 2, that the pin 47 protrudes from both sides of the trigger 49 and is dimensioned to pass through the port 25 but to engage the shoulders 22B as the launcher approaches its extended position. When the pin 47 is in engagement with the shoulders 22B, the trigger 49 is connected to the launcher section 16 so that the member 19 moves relatively to the firing member 27. The firing spring 39 is, accordingly, compressed during the short relative movement between the launcher sections necessary for the launcher to reach its extended operative position.

Unless the launcher is locked in its operative position, the firing spring moves the launcher section until it is no longer operative. For that reason, the housing member 23 has an opening 54 for a lock 55. The lock 55 is shown as of U-shaped cross section and pivotally mount-

ed on a transverse pin 56 to move into a position in which its lugs 57 enter marginal recesses 58 with which the rod 19 is provided, under the influence of a spring 59. When the lock 55 is thus positioned, an end engages the appropriate end of the opening 54 and is exposed to be manually engaged and depressed out of such engagement should it be desired to restore the launcher to its inoperative position. The rod member 19 is also provided with marginal recesses 60 spaced to be engaged by the lugs 57 of the lock 55 thus to releasably lock the sections when the launcher is in its shortened inoperative position.

A launcher in accordance with the invention is thus rendered operative, save for the release of the safety 53, by depressing the lock 55 and then extending the launcher into its operative position and until then, the trigger 49 is wholly concealed.

In accordance with the invention, the front housing portion 21 has an opening 61, see FIGURES 1, 2, and 8. Within the housing portion 21, there is a front sight 62 preferably in the form of a sheet of clear plastic and held on a transverse pin 63. A coiled spring 64 on the pin 63 is operative to urge the sight 62 into an erect position against the forward edge of the opening 61 but is yieldable to permit the sight 62 to be pivoted rearwardly into the housing portion 21 through the opening 61. The rod 19 is dimensioned so that, in the operative position of the launcher, its forward end 65 overlies the housed sight 62 and it is shaped and dimensioned then to close the opening 61. As the launcher is extended, the sight 62 is freed so that it is automatically positioned for use.

In addition, a rear sight 66, see FIGURES 1, 4, and 5, is attached to ears 67 on the rod 19 by a transverse pivot 68 so that it may pivot between a first position in which it is within the housing portion 21 and an upright position into which it is automatically raised as by the spring 69. In the operative position of the launcher, the rear sight 66 seats against the front end of the housing portion 23.

I claim:

1. In a rocket launcher, first and second tubular sections telescopingly connected to enable said launcher to be extended from a shortened, inoperative position into an elongated, operative position, one end of said first section being the breech end of the launcher, said first section fitting within said second section, said first section including a rigid member overlying said second section, said second section including a housing extending lengthwise thereof and receiving said member, and a rear sight transversely pivoted to said member and including a spring yieldably urging said sight into a position at right angles to the axis of said launcher from a position parallel thereto, and said rear sight being within said housing and held thereby in said parallel position when said launcher is in its inoperative position, said rear sight being out of said housing in said operative launcher position.

2. In a rocket launcher, first and second tubular sections telescopingly connected to enable said launcher to be extended from a shortened, inoperative position into an elongated, operative position, one end of said first section being the breech end of the launcher, said first section fitting within said second section, said first section including a rigid member overlying said second section, said second section including a housing extending lengthwise thereof and receiving said member, and a rear sight transversely pivoted at its bottom to said member and including a spring yieldably urging said sight into a position at right angles to the axis of said launcher from a position parallel thereto and extending rearwardly of its pivotal connection with said member, and said rear sight being within said housing and held thereby in said parallel position when said launcher is in its inoperative position, said rear sight being out of said housing in said operative launcher position.

No references cited.