

June 4, 1963

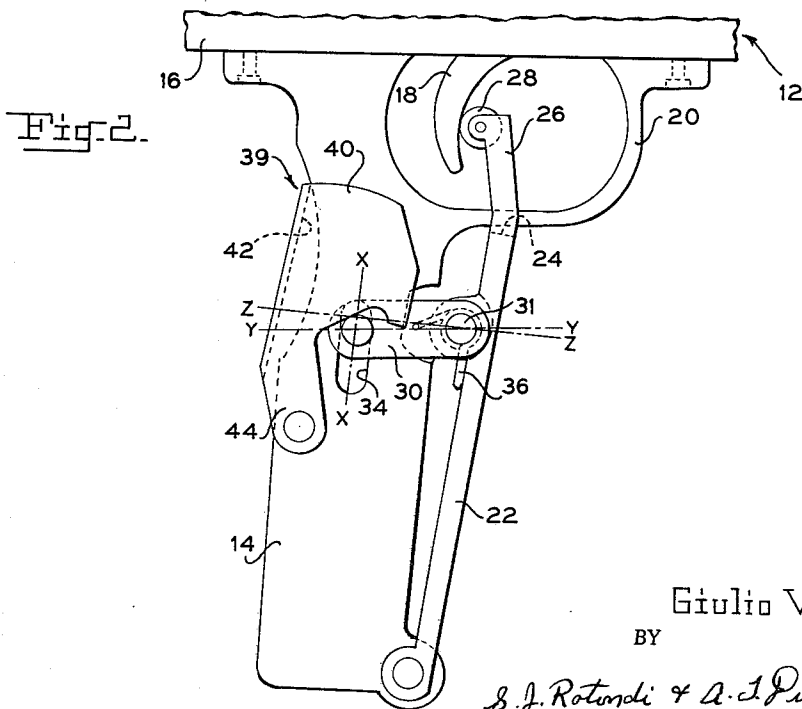
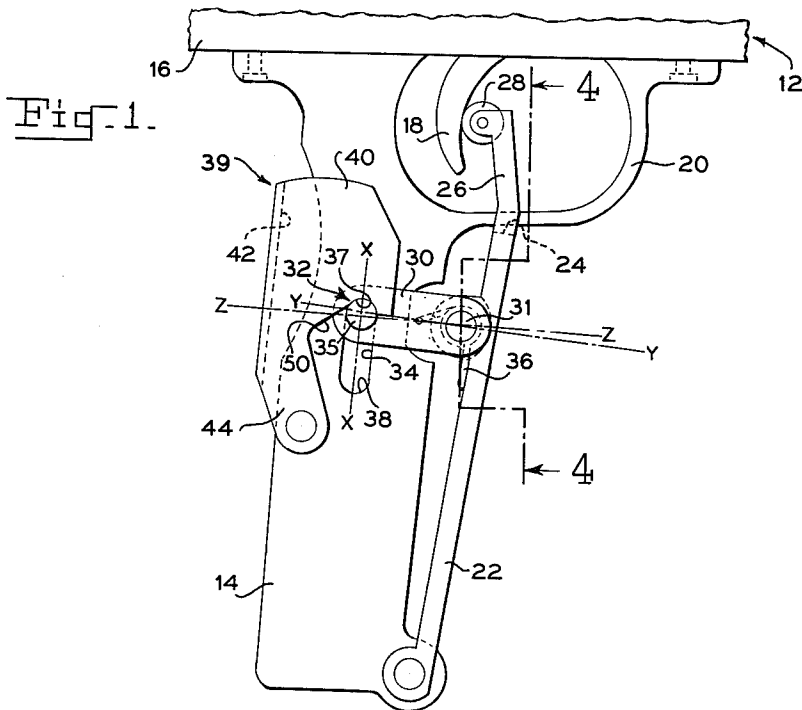
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3,091,878

AUXILIARY FIREARM TRIGGER WITH INTEGRAL SAFETY

Filed May 24, 1962

6 Sheets-Sheet 1



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AUXILIARY FIREARM TRIGGER WITH INTEGRAL SAFETY

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Fig. 3.

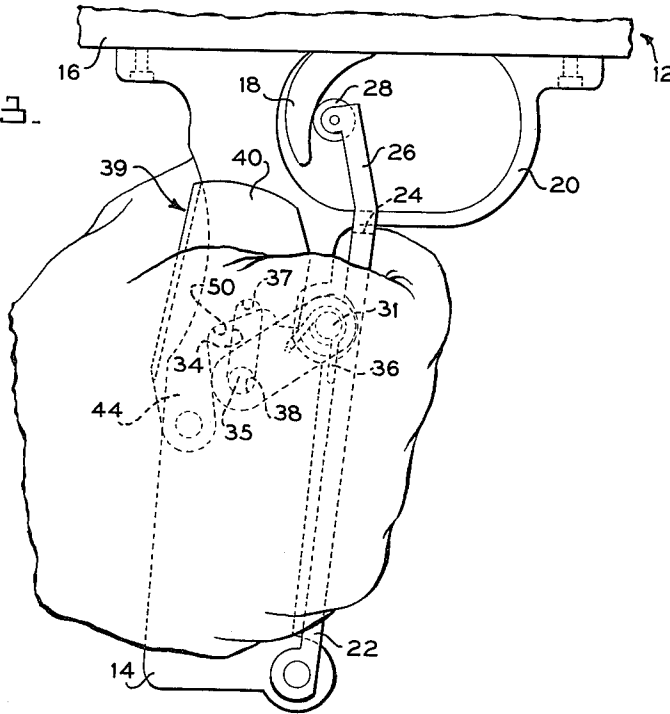
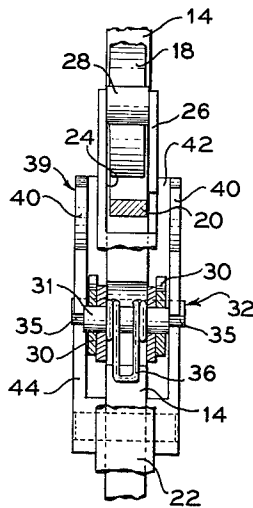


Fig. 4.



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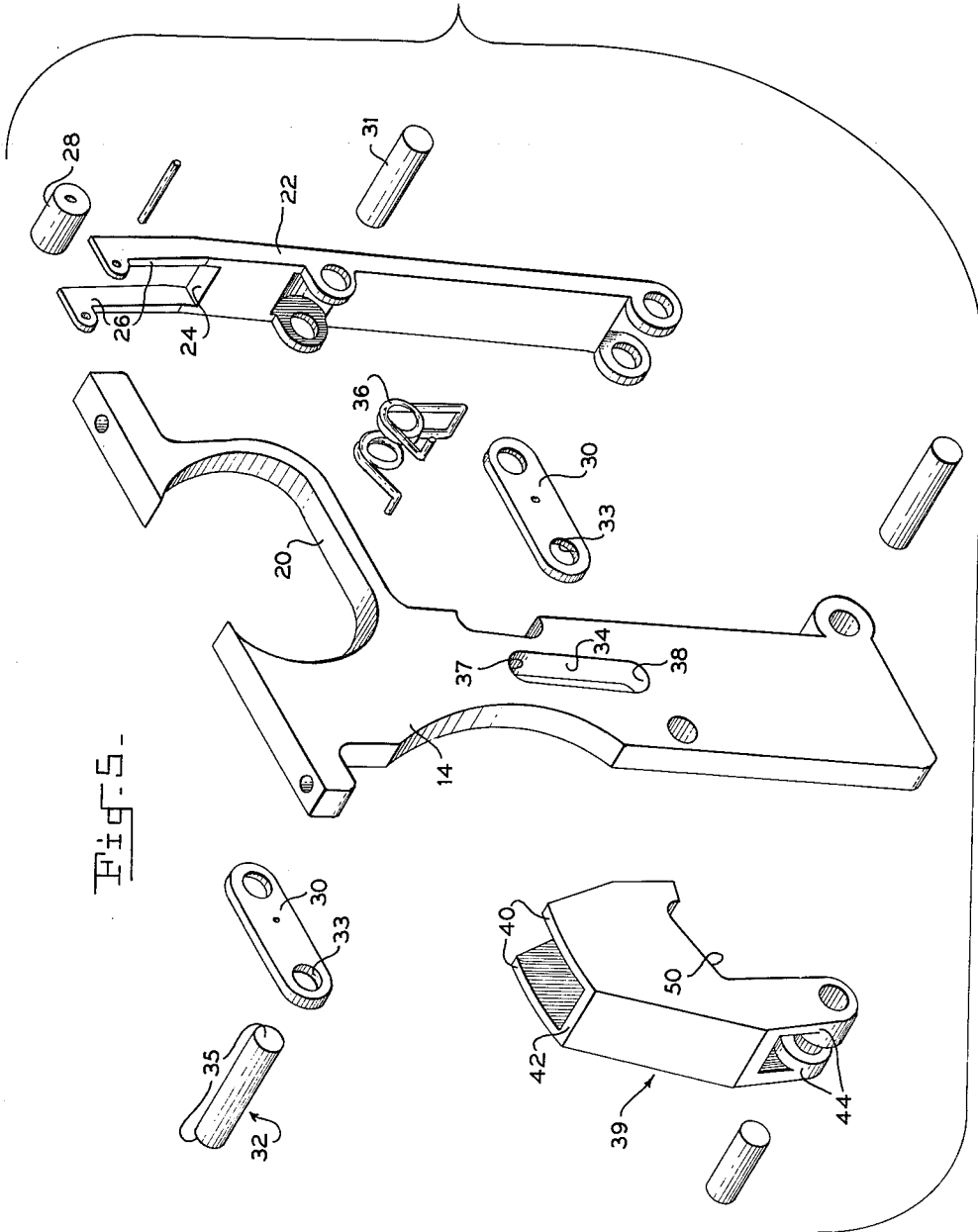


Fig. 5-

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Fig. 6.

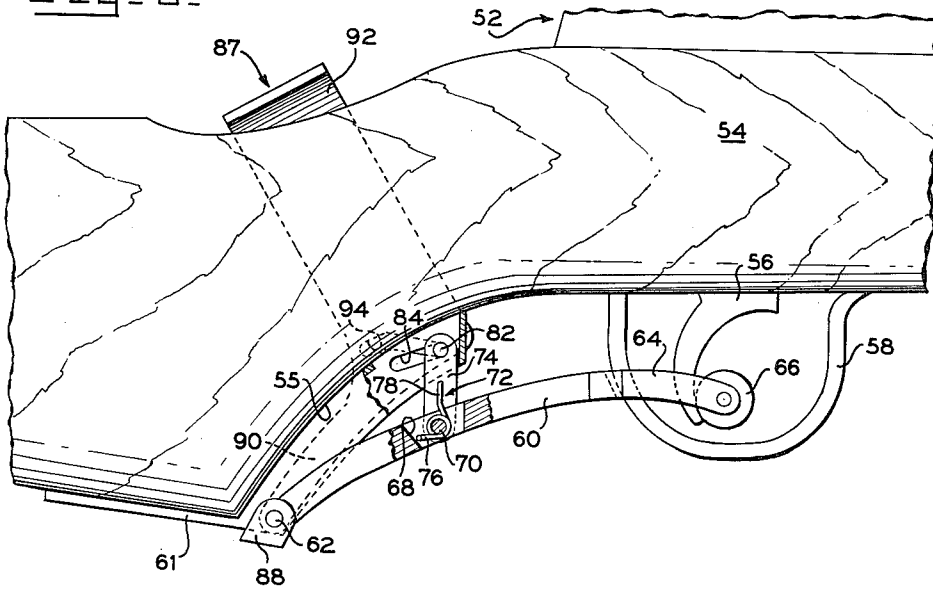
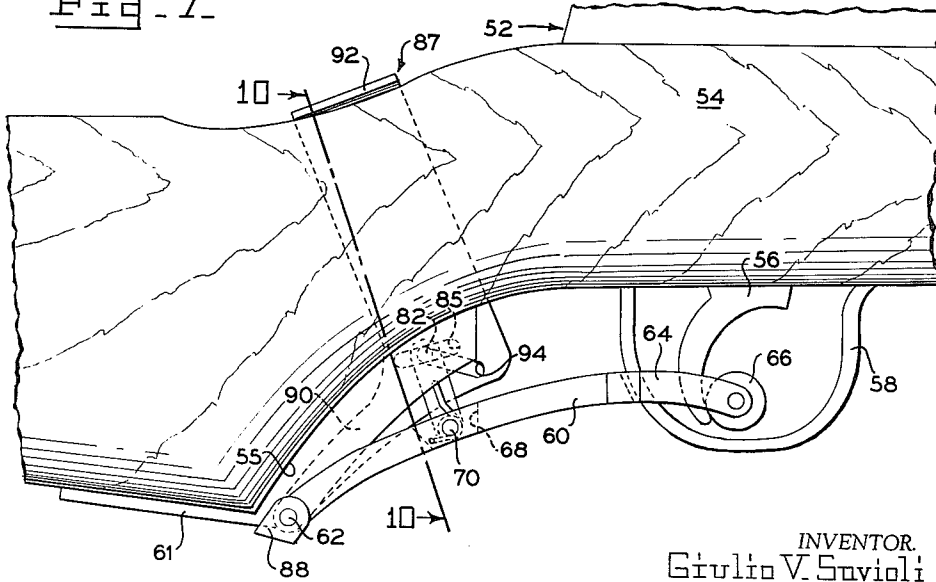


Fig. 7.



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Fig. 8.

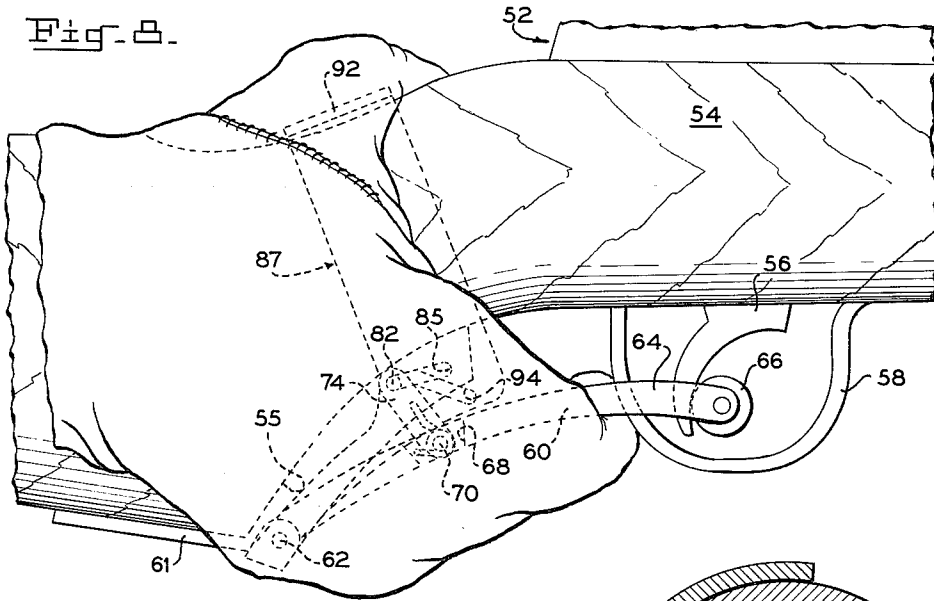
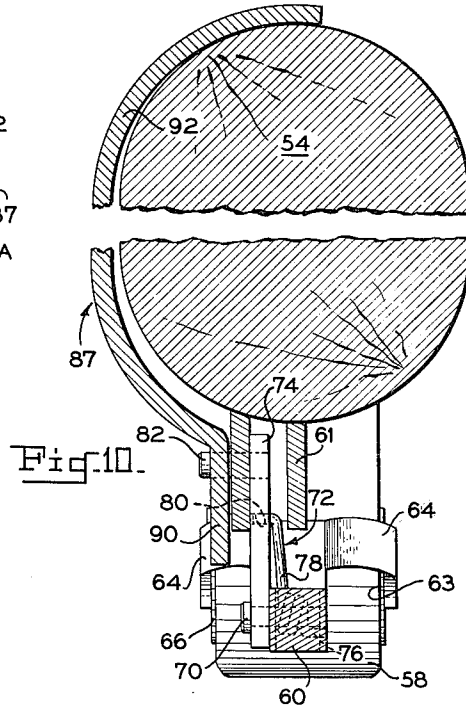
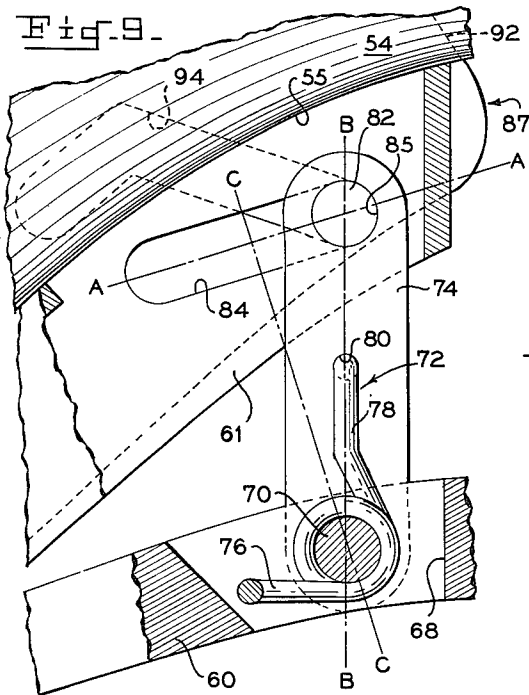


Fig. 9.



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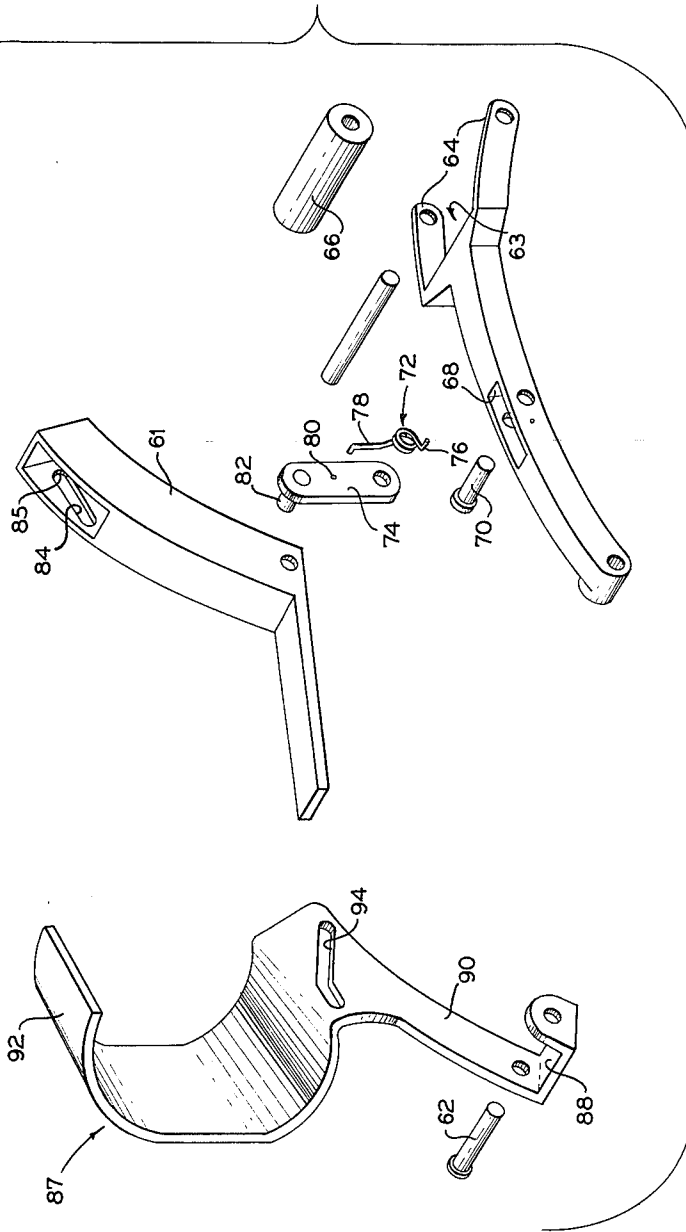
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Fig-11-



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AUXILIARY FIREARM TRIGGER WITH
INTEGRAL SAFETY

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6 Claims. (Cl. 42-69)

(Granted under Title 35, U.S. Code (1952), sec. 266)

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

This invention relates to firearms and more particularly to auxiliary trigger devices which are added so that the firearms may be fired by one wearing heavy mittens.

Where firearms are planned for use in regions or in conditions that require the protection of the hands by heavy mittens at all times, auxiliary trigger devices are added which make possible the actuation of the firearm trigger without having to remove the mittens. But with those firearms which have auxiliary trigger devices there has not been provided heretofore any means for actuating the firearm safety by a mittened hand and, consequently, the firearm is carried in combat conditions with the safety actuated to free the firing mechanism of the firearm for firing. This, obviously, creates a dangerous condition as the auxiliary trigger device is necessarily quite large as it must be actuated by a mittened hand and it also cannot be protected by a trigger guard.

It is, therefore, an object of this invention to provide for firearms an auxiliary trigger device with an integral safety which prevents actuation of the auxiliary trigger unless the safety is simultaneously actuated therewith.

It is a further object of this invention to provide in cooperation with the auxiliary trigger a safety device which does not require extra movement on the part of the operator and consequential loss of time before the auxiliary trigger is released for actuation.

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 an elevational view of a portion of a firearm having a depending pistol grip with the auxiliary trigger device installed thereon and shows the trigger bar in the extended position and the safety in the safe position;

FIG. 2 is a view similar to FIG. 1 but shows the levers actuated by the safety so as to release the trigger bar for displacement to the actuated position;

FIG. 3 is a view similar to FIGS. 1 and 2 but shows the trigger bar displaced to the actuated position and the safety displaced to the fire position thereof by a mittened hand gripping the pistol grip;

FIG. 4 is a view taken along line 4-4 of FIG. 1;

FIG. 5 is an exploded perspective view of the pistol grip and auxiliary trigger device;

FIG. 6 is a view of the auxiliary trigger device mounted on a rifle having a pistol grip portion on the stock and shows the trigger bar in the extended position and the safety in the safe position;

FIG. 7 is a view similar to FIG. 6 but shows the safety in the fire position;

FIG. 8 is a view similar to FIGS. 6 and 7 but shows the safety displaced to safe position and the trigger bar to the actuated position;

FIG. 9 is an enlarged fractional view showing the axial relationships of the lever and channel when the safety is in the safe position and the trigger bar is in the extended position;

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FIG. 10 is a view taken along line 10-10 of FIG. 7; and

FIG. 11 is an exploded perspective view of the auxiliary trigger device shown in FIGS. 6-10.

Shown in FIGS. 1-5 is a firearm 12 having a pistol grip 14 which depends from the firearm receiver 16 rearwardly of a trigger fingerpiece 18 which is conventionally spring-biased from a rearward firing to a forward normal position. Fingerpiece 18 is of conventional arcuate configuration and is protected by an encircling trigger guard 20. An auxiliary trigger, as represented by trigger bar 22, is mounted at one end to the front bottom corner of pistol grip 14 so as to extend upwardly along the front face thereof and so as to be pivotal between a forward extended and a rearward actuated position. The upper, or free end of trigger bar 22, is bifurcated to form a slot 24, which receives trigger guard 20, and a pair of flanges 26 which are positioned on opposite sides thereof. A roller 28 is mounted between flanges 26 so as to have contact with the front face of fingerpiece 18 so that, when trigger bar 22 is squeezed rearwardly to the actuated position against the front face of pistol grip 14, the fingerpiece is cammed to the firing position. The spring-bias of fingerpiece 18 applied against roller 28 returns trigger bar 22 forwardly to its normal, extended position when pressure against the trigger bar is released.

A pair of levers 30 are pivotally mounted on trigger bar 22 on opposite sides and approximately midway the length thereof by means of a lateral shaft 31. A pin 32 extends laterally through an elongated channel 34 in pistol grip 14 and the opposite ends are received as by press fit by bores 33 in the free ends of levers 30. Pin 32 extends through bores 33 to form outer ends 35 which have a function to be hereinafter described. A spring 36 is operationally disposed on shaft 31 between trigger bar 22 and levers 30 for biasing the levers in a clockwise direction, as seen in FIG. 1, to press pin 32 slidingly upward in channel 34.

Channel 34 includes a top end 37 and a bottom end 38 and is formed so that the long axis thereof, noted at $x-x$, is substantially vertically disposed. Channel 34 is also positioned in pistol grip 14 so that, when levers 30 are displaced to where pin 32 is in contact with top end 37 of the channel and trigger bar 22 is in its extended position out of contact with the front face of pistol grip 14, the functional axis of each of the levers, noted at $y-y$, is displaced upwardly past a position $z-z$ wherein the functional axis is in a dead center relationship with axis $x-x$ of the slot (FIG. 1). Thus, a rearward force applied to trigger bar 22 is converted to an upward direction of force in levers 30 but the upward displacement thereof is prevented by the contact of pin 32 with top end 37 of channel 34 so that trigger bar 22 is prevented from being inwardly displaced from its extended position.

Levers 30 are displaced downwardly so that functional axis $y-y$ is moved to the opposite side of position $z-z$ (FIG. 2) to free trigger bar 22 for inward displacement by a safety 39. Safety 39 is of channel configuration with a pair of side plates 40 and a connecting web section 42. Side plates 40 are spaced sufficiently to receive pistol grip 14 therebetween with web section 42 being disposed to the rear of the rear face thereof. The lower portion of web section 42 and the lower front section of side plates 40 are cut away to form a pair of arms 44, which are pivotally mounted on pistol grip 14 below the level of the bottom end 38 of channel 34, and a cam surface 50 extends upwardly and forwardly from each of the arms. Cam surfaces 50 are each formed so that, when safety 39 is squeezed forwardly from a rearward safe position to a forward fire position against the rear face of pistol grip 14, the cam surfaces are cammingly displaced against outer ends 35 to displace the free ends

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of levers 30 downwardly so that functional axes $y-y$ thereof are moved to the opposite side of position $z-z$ (FIG. 2).

Thus, it is seen that trigger bar 22 is prevented from being displaced to accidentally fire firearm 12 until safety 39 is squeezed against pistol grip 14 and that extra time and an extra operation on the part of the operator is not required to free the trigger bar for displacement to the actuated position as the action of closing the mittened hand to squeeze trigger bar 22 against the pistol grip to fire the firearm presses safety 39 forwardly to release the trigger bar.

Shown in FIGS. 6-10, is a rifle 52 with a stock 54 having a pistol grip 55 forwardly of which there depends a trigger fingerpiece 56 conventionally spring-biased from a rearward firing position to a normal forward position. Fingerpiece 56 is protected by an encircling trigger guard 58. A trigger bar 60 is pivotally mounted at the rear end to the underside of pistol grip 55 by means of a bracket 61, which extends along the bottom of the stock and pistol grip, and a transversal pin 62.

The free end of trigger bar 60 is bifurcated by a vertical recess 63 which forms a pair of laterally spaced arms 64. Recess 63 is arranged to receive trigger guard 58 and a roller 66 is mounted between arms 64 so as to have contact with the front face of fingerpiece 56. Through the conventional arcuation of fingerpiece 56, roller 66 has a camming relationship therewith so that, when trigger bar 60 is squeezed upwardly against stock 54 from an extended to an actuated position, the fingerpiece is actuated to the firing position.

Provided vertically through trigger bar 60, between the ends thereof, is a rectangular hole 68. A pin 70 is mounted laterally through trigger bar 60 so as to pass through hole 68. Pin 70 supports a coiled torsional spring 72 and pivotally mounts a lever 74. Spring 72 is provided with an arm 76 which is bent outwardly at a 90° angle to be received by a mating hole in trigger bar 60 and another arm 78, which is bent oppositely so as to be received by a mating hole 80 in lever 74, so that the lever is biased in a clockwise direction as seen in FIG. 6.

A pin 82 is fixed to the free end of lever 74 so as to extend laterally therefrom into an elongated channel 84 formed in bracket 61. Channel 84 is provided with a front end 85 and is formed so that the long axis thereof, noted at $a-a$, is substantially longitudinally disposed and so that, when pin 82 is in contact with front end 85 and trigger bar 60 is in its normal position, the functional axis of lever 74, noted at $b-b$, is located forwardly of a position $c-c$ wherein the lever is in a dead center relationship with the channel. Thus, when upward pressure is applied to trigger bar 60, pin 82 is pressed against the front end 85 of channel 84 to prevent upward displacement of the trigger bar. The bias of spring 72 against lever 74 holds pin 82 securely in contact with front end 85.

Lever 74 is displaceable rearwardly to the opposite side of position $c-c$, to free trigger bar 60 for displacement to the actuated position, by a safety 87 which is pivotally mounted on pin 62 for displacement between an upper safe position and a lower fire position. Safety 87 includes a stirrup portion 88, by which the safety is mounted on pin 62, an arm 90, which extends upwardly and forwardly therefrom along the underside of stock 54, and a depressor 92 which extends upwardly from the front end of the arm along the side of pistol grip 55 with the top end bent over the top thereof so that a mittened hand grasping the pistol grip to encircle trigger bar 60 also encircles the depressor. Provided in the lower end of depressor 92 is a cam slot 94 through which pin 82 extends so as to be slidable therealong. Cam slot 94 is formed so that, when depressor 92 is squeezed downwardly to displace safety 87 from the safe to the fire position, lever 74 is displaced rearwardly to the op-

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posite side of position $c-c$ to free trigger bar 60 for pivotal displacement to the actuated position.

From the foregoing it is apparent that rifle 52 can be readily fired by a mittened hand and that any accidental impact against trigger bar 60 will not cause the firearm to be fired. It is also clearly apparent that safety 86 is actuatable without loss of time or extra movement in the firing of rifle 12.

Although a particular embodiment of the invention has been described in detail herein, it is evident that many variations may be devised within the spirit and scope thereof and the following claims are intended to include such variations.

I claim:

1. In a firearm, the combination including a trigger fingerpiece displaceable between a normal and a firing position, a trigger bar disposed for pivotal displacement between an extended and an actuated position responsive to manual pressure applied thereagainst, means for transferring displacement of said trigger bar to the actuated position to said trigger fingerpiece for displacement to the firing position, lever and channel means arranged for cooperation with said trigger bar to releasably prevent displacement thereof from the extended position, a safety arranged to be manually actuated simultaneously with said trigger bar, and cooperating cam means in said safety and on said lever and channel means to release said trigger bar for displacement to the actuated position by actuation of said safety.

2. In a firearm having a pistol grip grippable by a mittened hand, the combination including a trigger fingerpiece actuatable from a normal to a firing position, a trigger bar mounted on the pistol grip so as to be encircled by the mittened hand when gripping the pistol grip and so as to be displaceable from an extended to an actuated position when the mittened hand is tightened thereagainst, means for transferring displacement of said trigger bar to the actuated position to said fingerpiece for actuation thereof to the firing position, lever and channel means operationally disposed between said trigger bar and the pistol grip for releasably preventing displacement of said trigger bar from the extended position, a safety mounted on the pistol grip so as to be encircled by the mittened hand and actuated with said trigger bar when the mittened hand is tightened thereagainst, and means disposed in said safety for cooperation with said lever and channel means to release said trigger bar for displacement to the actuated position when said safety is actuated therewith.

3. In a firearm having a pistol grip grippable by a mittened hand, the combination including a trigger fingerpiece actuatable from a normal to a firing position, a trigger bar mounted on the pistol grip so as to be encircled by the mittened hand when gripping the pistol grip and so as to be displaceable from an extended to an actuated position when the mittened hand is tightened thereagainst, a lever pivotally mounted on said trigger bar, a pin extending transversely through the free end of said lever, a channel having a first and a second end, said channel being formed so as to receive said pin for sliding displacement between said first and second ends and through a position wherein said lever is in a dead center relationship with said channel, said pin being in contact with said first end when said trigger bar is in the extended position and in contact with said second end when said trigger bar is in the actuated position, said channel being formed so that when said pin is in contact with said first end a force applied to said trigger bar for displacement thereof from the extended position is transferred to said lever so as to press said pin against said first end to prevent displacement of said trigger bar from the extended position, a safety mounted on said grip so as to be encircled by the mittened hand and actuated with said trigger bar when the mittened hand is tightened thereagainst, and means disposed in said safety and on said

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lever for displacing said lever to the opposite side of the dead center position to free said trigger bar for displacement to the actuated position when the mittened hand applies pressure to said safety.

4. The combination as defined in claim 3 and including a spring operationally disposed so as to bias said pin into contact with said first end.

5. The combination as defined in claim 3 wherein the pistol grip depends from a receiver rearwardly of said fingerpiece, said trigger bar is pivotally mounted at one end to the bottom front corner of said pistol grip so

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as to extend upwardly along the front face thereof, and said safety is pivotally mounted on said pistol grip so as to extend upwardly along the rear face thereof.

6. The combination as defined in claim 3 wherein the pistol grip is integrally formed on a rifle stock, said trigger bar is pivotally mounted by means of a bracket to the stock so as to extend forwardly underneath the pistol grip to said fingerpiece, and said safety includes a depressor extending over the pistol grip opposite said trigger bar.

No references cited.