

Dec. 14, 1965

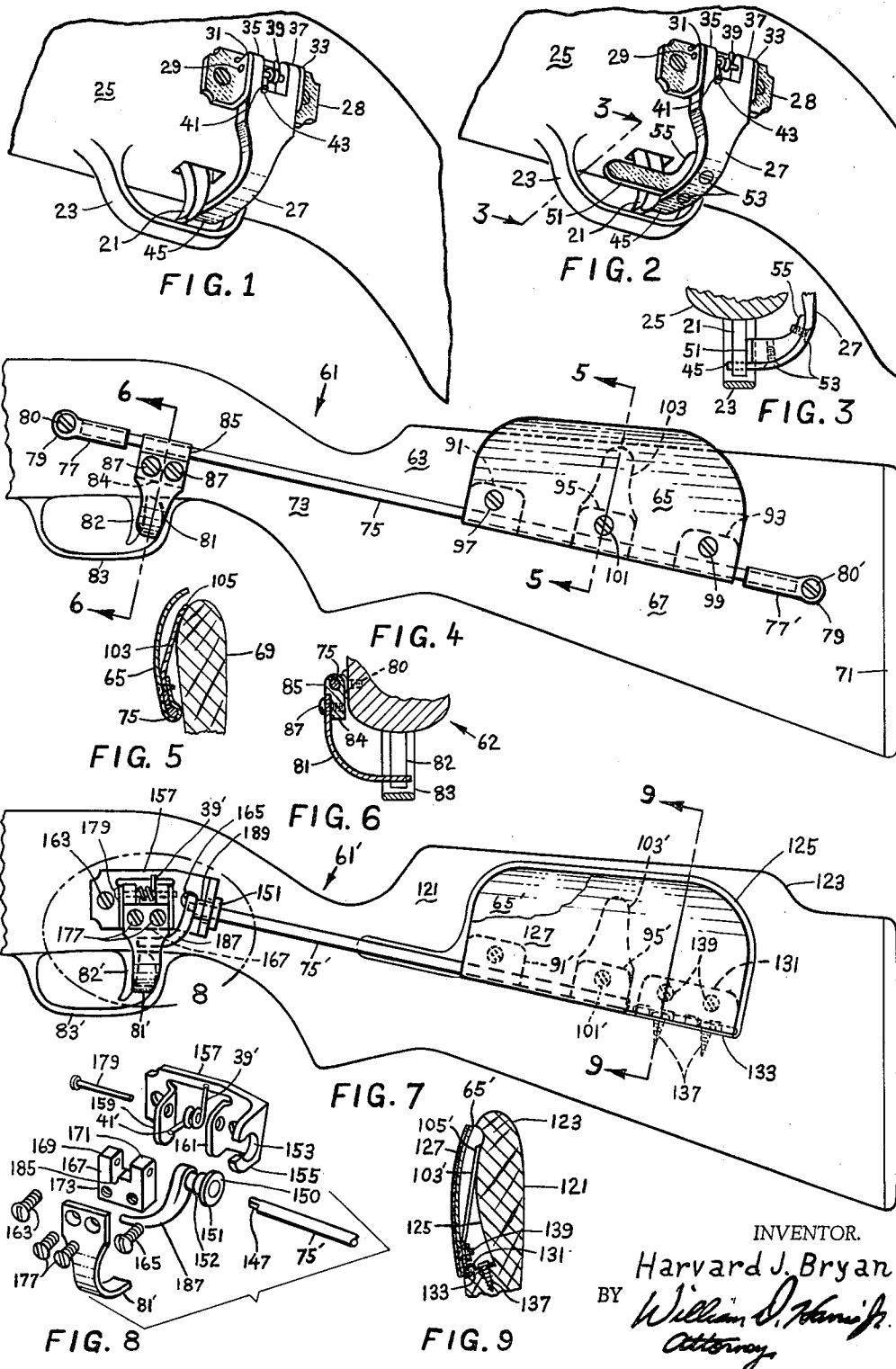
H. J. BRYAN

3,222,809

AUTOMATIC SAFETIES FOR GUNS

Filed June 8, 1964

2 Sheets-Sheet 1



INVENTOR.

Harvard J. Bryan
BY *William D. Minick*
Attorney

Dec. 14, 1965

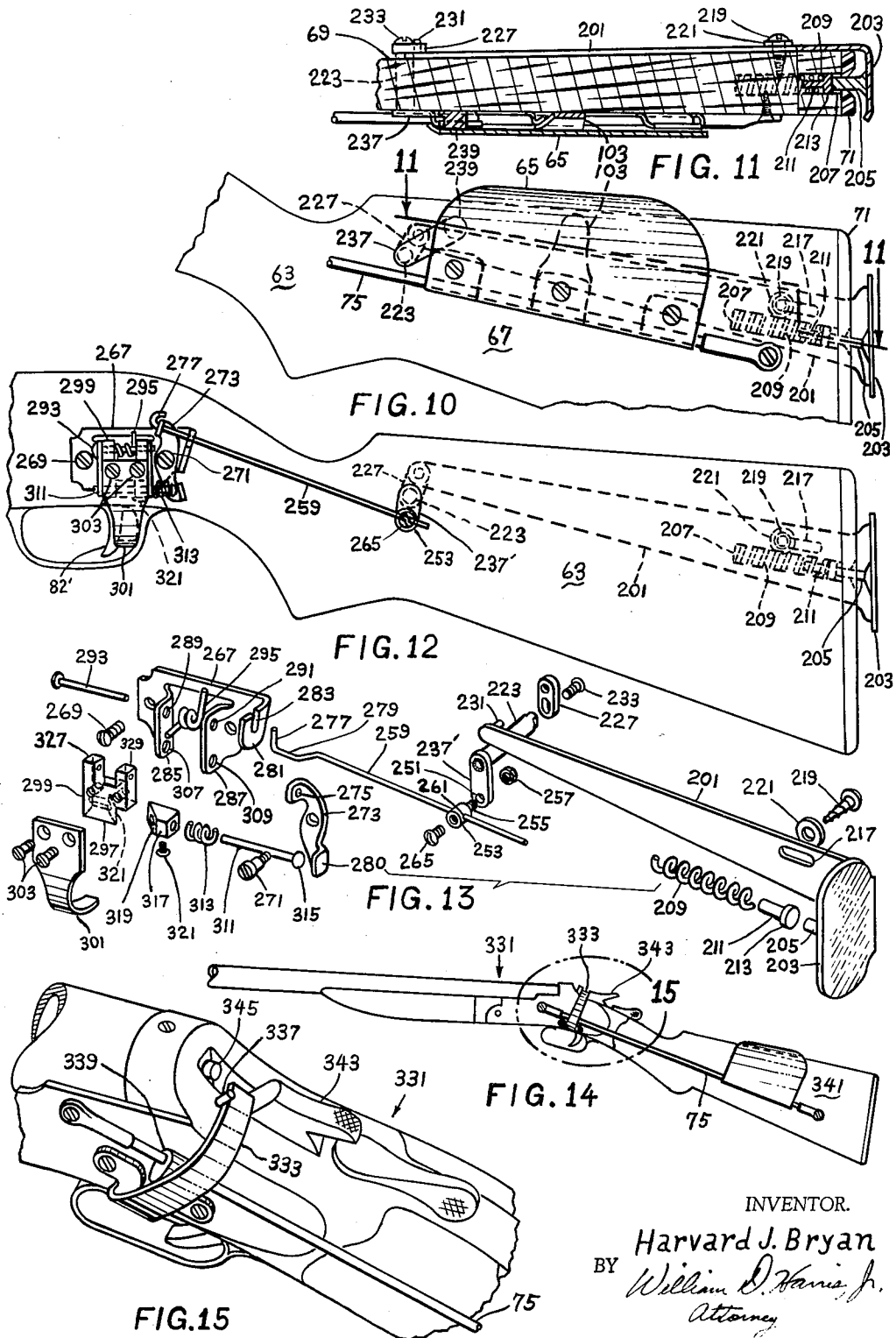
H. J. BRYAN

3,222,809

AUTOMATIC SAFETIES FOR GUNS

Filed June 8, 1964

2 Sheets-Sheet 2



INVENTOR.

Harvard J. Bryan
BY William D. Harris, Jr.
Attorney

United States Patent Office

3,222,809

Patented Dec. 14, 1965

1

3,222,809

AUTOMATIC SAFETIES FOR GUNS

Harvard J. Bryan, 9303 Sorrento, Dallas, Tex.

Filed June 8, 1964, Ser. No. 373,388

17 Claims. (Cl. 42—70)

This invention relates to gun safeties, and more specifically to automatic safeties.

Various types of gun safeties have been proposed and used. The most general type in use involves mechanism internal of the gun. Such safeties require independent movement of the shooter, not normally accomplished incidental to firing the gun and though they may be adequate to prevent the gun from firing when they are in "on" position, there is a constant danger in the shooter forgetting to push the safety back to on position after shooting or after failing to get an expected shot.

Some safeties have been proposed in an effort to minimize or eliminate the danger mentioned above, however, for one reason or another these safeties are generally impractical. Complexity of installation is the most prevalent, but failure to provide for maximum safety and failure to operate properly are prominent among the difficulties and problems of such prior safeties. This statement is supported by the fact that, even though automatic safeties were introduced many years ago, the public has not accepted them.

The greatest improvement over the prior art in safeties of this type is provided by the automatic safeties described herein which require the shooter to hold the gun in normal shooting position with his head in sighting position so as to press his cheek against an automatic safety release plate in order to fire the gun. This is intended to require the shooter to be looking down the barrel in the direction of fire before the gun can fire.

It is an object of the instant invention to provide safety means which are de-activated to arm the gun incident to normal operations in bringing the gun to shooting position, yet which are again activated to prevent firing when the gun is moved out of normal firing position. It is an additional object to provide such means that are simple to install, effortless to operate and efficient, and that are highly reliable.

It is an additional object of this invention to provide safety means which may be mounted externally in a simple but efficient manner on a standard gun and which may serve as an automatic safety means in addition to the conventional, manually-operated safety.

It is a further and more specific object to provide a combination of safety means to increase reliability to the point where the safety system is essentially foolproof.

In accordance with the present invention, automatic safeties are provided for various conventional guns by the employment of an external finger moveably attached to the gun. The finger is moveable from a normal position to an armed position and it has a firing means engaging portion. The firing means engaging portion is in engagement with the firing means when in normal position to restrain actuation of the firing means, but is out of engagement with the firing means when in armed position. Means are provided to urge the finger into the normal position.

A preferred embodiment of this invention provides a gun safety comprising cheek-engaging means disposed in the cheek area of a gun stock, moveable restraining means for restraining the actuation of the gun's firing means when in a normal position but moveable to permit the actuation of the firing means when in an armed position, and means operatively connecting the moveable restraining means and the cheek-engaging means to move the

2

restraining means from the normal position to the armed position when the cheek-engaging means are engaged.

In another preferred embodiment, a gun safety is provided which comprises means for restraining the actuation of a gun's firing means when in a normal position but moveable to an armed position permitting the actuation of the firing means, shoulder-engaging means behind the butt of the gun's stock, and external push rod means cooperating with the shoulder engaging means to move the restraining means to an armed position from a normal position when force is applied to the shoulder-engaging means.

A more specific preferred embodiment of the invention comprises a gun safety with a cheek contact plate adjacent the cheek area of a gun's stock, spring means resiliently urging the contact plate outwardly from the stock but yieldingly permitting inward movement on the application of pressure to the cheek plate, an external pivotally mounted retainer finger riding behind the gun's trigger when in a normal position, but pivotal outwardly into an armed position to clear the movement of the trigger and permit its actuation, and a connecting rod secured to the gun running external thereof to operatively connect the contact plate with the trigger retainer finger to cause the finger to pivot from the normal to the armed position when the plate is moved inward.

An alternative specific preferred embodiment includes a gun safety comprising trigger restraining means having a normal position restraining actuation of a gun's trigger by contact therewith and having a retracted position permitting actuation of the trigger, forward moveable shoulder plate means extending over the butt end of the gun's stock and adapted for engagement with the shoulder of a shooter when raised to firing position, external push rod means connected to the plate means adapted to move when the plate means is moved forward, pivot means operatively connecting the trigger restraining means and the push rod means to move the trigger restraining means to the retracted position when the shoulder plate means is moved forward.

Yet an additional aspect of this invention contemplates a combination of external safety means, including a cheek plate in the cheek area of the stock to release, on inward movement, a safety finger restraining firing the gun, and auxiliary safety means to hold the cheek plate and restrain it from moving when the auxiliary safety means are in the safety position but which permit the cheek plate to be moved when the auxiliary safety means are in an armed position. Even more specifically, shoulder actuated plate means behind the butt of the gun may be provided to move the auxiliary safety means to the armed position when suitable pressure is applied to the shoulder plate means.

For a more complete understanding of the present invention and for further objects and advantages thereof, reference may now be had to the following description taken in conjunction with the accompanying drawings in which:

FIGURE 1 is a partial perspective view illustrating a trigger portion of a gun having a safety in accordance with this invention incorporated therewith;

FIGURE 2 is a perspective view of a slightly modified embodiment of the safety of FIGURE 1;

FIGURE 3 is a partial view of the structure of FIGURE 2, illustrating a part of the trigger and the safety portion adjacent thereto as viewed from 3—3 of FIGURE 2.

FIGURE 4 is a partial view, as seen from the side, of a gun having a preferred embodiment of this invention installed thereon;

FIGURE 5 is a sectional view taken along 5—5 of FIGURE 4;

FIGURE 6 is a sectional view taken along 6—6 of FIGURE 4;

FIGURE 7 is a partial view, as seen from the side, of a gun having an alternative preferred embodiment of this invention installed thereon;

FIGURE 8 is an exploded perspective view of a part of the safety mechanism of the invention of FIGURE 7;

FIGURE 9 is a sectional view taken along 9—9 of FIGURE 7;

FIGURE 10 is a partial side view illustrating a somewhat modified embodiment of the invention illustrated in FIGURE 4, the additional refinement of the cooperative auxiliary safety means being utilized therein;

FIGURE 11 is a sectional view taken along 11—11 of FIGURE 10;

FIGURE 12 is a partial side view illustrating the pertinent portion of a gun with yet another embodiment of this invention installed thereon;

FIGURE 13 is an exploded view illustrating in perspective the parts of the safety of FIGURE 12;

FIGURE 14 is a side view illustrating a gun having the same type cheek plate as the embodiment illustrated in FIGURE 4, but having a curved safety finger to restrain a hammer mechanism on the gun; and

FIGURE 15 is a perspective view of that portion of FIGURE 14, within the elliptical area designated 15.

Referring to FIGURE 1, the portion of a conventional gun that includes the trigger and trigger guard is illustrated together with an embodiment of this invention. Trigger 21, enclosed by trigger guard 23, extends from the conventional firing mechanism within gun 25. Safety finger 27 extends downwardly from its pivotal transverse connection with transverse pivot pin 29. Pivot pin 29 is retained by ears 31 and 33, which have aligned holes to receive said pin. The upper portion of safety finger 27 is U-shaped, with thickened lugs 35 and 37 defining side members of said U. Aligned transverse openings of circular cross-section pass through lugs 35 and 37. Pin 29 passes through the openings in lugs 35 and 37, thus suspending safety finger 27 therefrom. Nestled between the upper open portion between the lugs 35 and 37 and riding on pin 29 is spring 39. An outwardly extending end 41 of spring 39 lies against the surfaces of receiving slot 43, a semicylindrical slot extending across the thickness of upper edge of safety finger 27 beside lug 35. The other end of spring 39 extends upwardly and bears against the upper intermediate portions of mounting bracket 28.

As described, the safety finger 27 is in its normal position with its lower inwardly extending portion 45 riding against or closely adjacent the rear surface of trigger 21. Actuation of trigger 31 is thus restrained.

In operation, safety finger 27 may be pulled outwardly against the resisting force of spring 39 to permit trigger 21 to actuate and the gun to be fired. Spring 39 returns the safety finger to its normal position thereafter.

The basic assembly described above without some further refinement is rather awkward to operate. Accordingly it is preferred that some means to facilitate actuation of finger 27 be provided. Such means is illustrated in FIGURE 2, wherein an actuating tab 51 extends from the intermediate lower portions of finger 27. Tab 51 is affixed to finger 27 by suitable means, for example, screws 53 which pass into mounting flange 55. Mounting flange 55 is curved to lie against the inner surface of the lower intermediate portions of finger 27. It is integral with tab 51 and extends transversely therefrom. Thus, tab 51 is oriented to lie on the outer side of, and closely adjacent to trigger 21, as illustrated in FIGURE 3.

In operation, the safety finger 27 of FIGURES 2 and 3 is moved outwardly by the finger of a shooter as he inserts it to engage trigger 21 for actuation. The force of the shooter's finger pressing on the side of the tab causes finger 27 to start pivoting about pin 29 against the action of spring 39. After the shooter's finger has moved the tab outwardly a short distance, then safety finger 27 has

pivoted sufficiently that its lower extremity has moved from behind trigger 21 to permit it to be actuated. After firing, the spring 39 returns the finger 27 to its normal position restraining actuation of trigger 21.

A preferred embodiment of this invention which includes a cheek plate to actuate safety means is illustrated in FIGURE 4—FIGURE 5. Therein, conventional gun shown in general by numeral 61 having a barrel on its forward cutaway portion (not illustrated) and with stock 63 is shown with cheek plate 65 positioned adjacent said stock. Stock 63 is preferably wooden or plastic. It is conventional with a cheek side 67, an opposite side 69 (best illustrated in FIGURE 5), and has conventional butt portion 71. Cheek plate 65 extends generally upward from the central portion of cheek side 67. It may be disposed in a variety of positions; however, it is located sufficiently rearward of pistol grip portion 73 and forward of butt 71 so that it may be engaged by a portion of the head, including the cheek, of a shooter when the gun 61 is raised to shooting position with its butt against the shoulder of the shooter and with the shooter's head inclined in the shooting position. It is to be understood in this specification that the area of the stock lying adjacent where cheek plate 65 is mounted is limited only in location by such a position that a portion of the head of the shooter will contact a part of the cheek plate when the gun is in shooting position. That area on the stock is often referred to hereinafter, including the claims, as the cheek portion of the stock. In some guns it will be found that the cheek portion is raised or other special provisions are made to comfortably accommodate the head portions of the shooter which engage it, but in other guns, the cheek portion has no special provision made and is merely a central portion of the cheek side of the stock.

Plate 65 is carried by elongated rod 75 which extends from a rear portion of the stock to a position above and slightly in front of the trigger, where its end is supported by bearing 77, which has a cylindrical cavity formed therein to receive the end of said rod and permit the axial rotation thereof. Bearing 77 has a forward flattened portion 79 which has a transverse bore passing therethrough to receive screw 80, which engages the gun to hold bearing 77 in position. The rear end of rod 75 is supported by a similar bearing 77', which is held in position by a screw 80', which passes through the flattened forward portion 79' of bearing 77' and into gun 61.

Curved finger 81, when it is in normal position, lies with its free end behind trigger 82 and in front of the rear of trigger guard 83. Finger 81 is firmly attached to rod 75 by means of connecting piece 84 which has an annular collar 85 force-fitted upon 75. The lower depending portion of connecting piece 84 is joined to the upper flattened portion of finger 81 by screws 87, which pass through mating openings provided in these parts.

It will be noted that rod 75 and cheek plate 65 are joined by folded tabs 91, 93 and 95, which are held in nonrotatable and firm engagement with said rod 75 by screws 97, 99 and 101, after adjusting to allow proper amount of movement of finger 81.

Spring 103 extends from its connection with plate 65 near the lower portion of said plate, where it is held by screw 101, upwardly to bear with its free end 105 against the upper surface portions of stock 63. It will thus be appreciated, as is best illustrated in FIGURE 5, that plate 65 is carried on rod 75 and pivots, carrying rod 75 in rotation with it, when an inwardly directed force is applied to the plate. Spring 103 urges the plate outwardly into the position shown in FIGURE 5 and it yieldably resists rotation when such inward force is applied to the plate.

In operation, the safety of FIGURES 4—6 moves from its normal position to an armed position which permits the trigger to be pulled when the shooter raises the gun to shooting position and moves the portions of his head which normally lie adjacent the cheek portions of the

5

stock into engagement with plate 65. The application of a relatively light pressure by the head of the shooter overcomes the resisting force offered by leaf spring 103 and the plate 65 revolves inwardly thus rotating rod 75 with it. Rod 75, on its rotation, carries safety finger 81 with it and retracts its lower curved portion from behind trigger 82 to permit said trigger to be pulled and the firing mechanism actuated. After the pressure is removed from plate 65 by the shooter, the leaf spring 103 causes the rod 75 to rotate the finger 81 to the normal position behind trigger 82, thus guarding against accidental firing.

A modified embodiment of this invention is illustrated in FIGURE 7. Therein the gun, shown in general by numeral 61', with the trigger 82' and trigger guard 83', has a modified stock 121 which has its cheek portion raised, indicated in the area 123. A recess 125 is cut into the raised cheek portion to make provision for adjacent mounting of cheek plate 65'. Cheek plate 65' is generally configured as cheek plate 65, except it has a felt-like cover 127 joined to the outer surface thereof, as by a suitable adhesive, and it does not have a rear folded tab 93. Plate 65' is pivotally joined to stock 121 by hinge 131, with one wing of the hinge joined to the lower shoulder 133 bounding recess 125 by screws such as 137, and the other wing of the hinge joined to the lower rear portion of the face plate by screws 139. Rod 75' is rigidly attached to plate 65' by tight engagement with screw tightened field tabs 91' and 95'. Leaf spring 103' extends upward from the lower central portion of plate 65' from its attachment therewith by screw 101'. Upper portion 105' or leaf spring 103' engages upper surfaces of the recess portion 125.

The forward end of rod 75' is notched at 147 (See FIGURE 8) to engage a recess in the rear face 150 of rotatable boss 151. Rotatable boss 151 is journaled with its central portion 152 riding in curved bearing surface 153 which surfaces is formed in outwardly extending end 155 of safety finger mounting bracket 157. Mounting bracket 157 has ears 159 and 161 which extend outwardly. The bracket is held in place against the side of the gun just above the trigger by screws 163 and 165. An open portion is provided in mounting bracket 157 between ears 159 and 161 and therein pivot block 167 rides. It is generally U shaped with upstanding legs 169 and 171 having aligned holes drilled therethrough and with lower base portion 173 extending downwardly to receive the upper portion of safety finger 81'. Screws 177 hold said safety finger 81' in fixed engagement with respect to pivot block 167. A pin 179 extends through aligned openings in ears 159 and 161, respectively, and also extends through the aligned openings in the upstanding legs 169 and 171. It likewise extends through the axial space central of the coils of spring 39'. End 41' of spring 39' rides in engaging slot 185 formed in the upper portion of base 173 of pivot block 167. The other end of spring 39' rides against the top portion of bracket 157.

Boss 151 is attached to actuator arm 187 by means of reduced cylindrical portion 189. This reduced cylindrical portion facilitates the easy assembly of boss 151 within engaging bearing surface 153. Actuator arm 187 has a free extending lower portion disposed just inward from safety finger 81'.

In operation, the embodiment illustrated in FIGURE 7 is raised into firing position by the shooter and when portions of his head engage felt-like cover 127 of plate 65' and exert some pressure thereon, the resisting force offered by spring 103' is overcome and plate 65' moves inwardly as the upper wing of hinge 131 folds. Rod 75' is carried in rotation by movement of attached plate 65'. Its forward end causes boss 151 to rotate and move attached actuator arm 187 outwardly against safety finger 81'. Safety finger 81' moves outwardly as pivot block 167 pivots against the action of spring 39'. When sufficient rotation has occurred, safety finger 81' has cleared

6

its normal position behind trigger 82' and the trigger may be pulled to fire the gun. When the pressure of the shooter's head is removed from the cheek plate 65', it will be evident that spring 103' returns plate 65', and hence actuator arm 187, to normal safe position. Spring 39' returns safety finger 81' to its normal safe position.

An alternate embodiment, utilizing additional safety means, is illustrated in FIGURES 10-11. Therein the gun of FIGURE 4 is shown with only enough of the features of the safety means of FIGURE 4 illustrated to show the cooperation of an auxiliary safety feature therewith. It will be noted that the side 69 of stock 63 opposite cheek side 67 has longitudinally extending push rod 201 disposed thereby. Shoulder plate 203 extends transversely over the end of the butt 71 from the rear extremity of push rod 201. This plate is spaced from the butt when in normal position. Stud 205 is fixedly secured to the inner central portion of plate 203, and extends inwardly into a cavity 207 bored into the end of stock 63. Spring 209 rests within cavity 207 and spring follower 211 with its diametrically enlarged head 213, of only slightly lesser dimensions than the diameter of cavity 207, is engaged with said spring with its shank running into the axial space between the inner surfaces of the coils and with its head 213 in engagement with the extremity of the spring closest to the butt end of the stock. It will be noted that in its normal position, push rod member 201 is so oriented that stud 205 makes contact with head 213.

Push rod 201 has a slot 217 passing therethrough. This slot runs in the direction of the length of 201 and is close to the rear of 201. Screw 219 with its associated washer 221 passes through slot 217 and into the adjacent portion of side 69 of the stock. The slot is so disposed that its forward end engages the side of the shank of screw 219 when push rod 201 is in its normal position, as illustrated in FIGURE 10. Screw 219 is spaced so that push rod 201 may be manipulated back and forth with the surfaces defining slot 217 riding on the shank of screw 219. The adjustments in spacing of the slot, push rod, screw, spring, stud, and spring follower are preferably such that a very slight spring compression is maintained when these parts are in the position indicated in FIGURES 10-11. Thus, a small positive engaging force exists between the end of stud 205 and head 213 of spring follower 211.

A hole is drilled near the forward end of the stock passing transversely therethrough to receive crankshaft 223. The portion of shaft 223 extending from the opposite side 69 of the stock has a rectangular shoulder formed on its end. This shoulder engages opposite crank throw 227 through a lower rectangular opening which mates therewith. The upper portion of opposite throw 227 has an opening of circular cross section which rotatably receives cylindrical lug 231, which extends outward transversely from the forward end of push rod 201. Screw 233 passes through the lower rectangular opening in opposite crank throw 227 and into a threaded bore in the rectangular shoulder on shaft 223.

Cheek crank throw 237 extends transversely from crankshaft 223 on the cheek side of the stock. Cheek crank throw 237 and shaft 223, are dimensioned to insure that 237 can pivot in the space between the upper, inner surface portions of plate 65 and the adjacent surface of the cheek area of the stock. Cheek crank throw 237 is fixedly joined to shaft 223. Stop 239 extends transversely outward from the free end of crank throw 237.

In operation it will be appreciated that the auxiliary safety feature of FIGURES 10-11 insure that plate 65 cannot be pressed inward to free the safety finger attached to rod 75 from its engagement behind the trigger until push rod 201 has moved forward a sufficient distance to rotate crankshaft 223, and hence crank throw 237 counter-clockwise as viewed in FIGURE 10, to clear stop 239 from between the cheek contact area of the stock and the

plate 65. This motion of push rod 201 occurs when the shooter raises the gun to firing position and engages the gun butt, including the extending shoulder plate, with his shoulder and applies pressure. The application of such shoulder pressure moves the rod forward and, hence, clears stop 239, as explained above. Thereafter, the plate 65 maybe pressed inwardly by head portions of the shooter and the gun fired. After removal of shoulder pressure of the shooter from the plate 203 the spring 209, which was depressed as push rod 201 moved forward, returns the push rod to its normal position.

It is thus seen that the form of the invention illustrated in FIGURES 10-11 provides an auxiliary safety in conjunction with the cheek plate-type safety described in prior embodiments discussed herein.

An alternate preferred embodiment of my invention is illustrated in FIGURES 12 and 13. Therein, the push rod 201, with shoulder plate 203, contains many components previously described in connection with embodiment of FIGURES 10-11, which components are given the same numbers. For example, it will be noted that the push rod is mounted to the gun stock 63 in exactly the same manner as in FIGURE 10, including spring 209 to force the push rod 201 normally rearward and the slot 217 and screw 219 sliding therein to permit axial movement of the push rod. The substitutions and additions required in the structure of FIGURES 12-13 will now be discussed and described. Retainer 253, a threaded annular collar having a projecting lug 255 extending axially from its inner end, is supported by cheek throw 237' by engagement of lug 255 within mating opening 251. Nut 257 rides on the bushing of lug 255 extending beyond the inner face of throw 237' and holds lug 255, and hence retainer 253, in position. Connecting rod 259 has its rear end extending through opening 261 in retainer 253 to provide means for adjustment of the mechanism. The rod is held in position in the retainer, after adjustment, by screw 265, which engages threads within retainer 253. Mounting bracket 267 is disposed above the trigger 82', being held in position by screws 269 and 271, which pass through openings on opposite ends of the bracket and into the side of the gun. Pivot arm 273 is pivotally mounted on an enlarged cylindrical shoulder portion of screw 271. The upper end of pivot arm 273 is turned outwardly transverse to the axis of elongated rod 259, and has an opening 275 formed therein through which passes the hooked end 277 of rod 259. Note that forward shank portion 279 of rod 259 is suitably bent to provide proper alignment of the rod in the position described. The lower end of pivot arm 273 is turned outwardly to define lower engaging lip 280.

Transversely turned end 281 of mounting bracket 267 has a longitudinal slot 283 passing vertically downward from its upper edge. The slot 283 permits rod 259 to engage the pivot arm 273 in the manner described, and allows for rod displacement resulting from the turning of crank 223. Outwardly turned ears 285 and 287 have aligned upper openings 289 and 291 which receive retainer pin 293. Spring 295, which is shaped just like springs 39 and 39', previously described herein, rides on the shank of pin 293. Its outer end rests in slot 297 of pivot block 299. Curved safety finger 301, shaped just like safety finger 81 and 81' previously described herein, is connected to pivot block 299 by means of screw 303, which passes through suitable openings provided in the upper portion of the safety finger and threadedly engaged mating openings provided within the lower portion of pivot block 299. Aligned openings 307 and 309 in the lower portions of outwardly turned ears 285 and 287, respectively, receive shank portions of lower pin 311. Pin 311 passes through the axial opening provided by the coils of return spring 313. The forward end of spring 313 is restrained by the rear face of outwardly turned ear 287. Head 315 on the end of pin 311 is larger than the opening through the coils of spring 313 and rests against the rear end of said spring.

The spring rides on pin 311 between ear 287 and head 315. The pivot block 299 is notched along its inward surface adjacent pin 311 permitting pin 311 to clear pivot block 299, and enter lower hole 307 in ear 285. Just in front of ear 287, the shank of pin 311 carries camming block 317 which has an opening suitably drilled therethrough to receive said shank. Forward vertical face 319 of camming block 317 is disposed at an angle of about 45° with respect to the transverse axis of the gun. This face 319 provides an engageable camming face which mates with inclined lower face 321 formed on the lower rearward edge portion of pivot block 299. Pin 311 is held in fixed position with respect to camming block 317 by lower screw 321 which passes through the lower portion of block 317 and is tightened with its end securely against the adjacent shank portion of pin 311.

Pivot block 299 is supported from ears 285 and 287 by means of the shank of upper pin 293, suitable openings being formed in the upwardly extending legs 327 and 329 of pivot block 299. The pivot block is thus carried so that it may be pivoted outwardly against the action of spring 295.

In operation, the embodiment of FIGURES 12-13 is raised to the shoulder of the shooter and shoulder pressure is applied to shoulder plate 203. The push rod 201 is moved forward by the shoulder pressure and rotates crankshaft 223 to pull rod 259 rearward. As rod 259 moves rearward, it pulls the upper portion of pivot arm 273 rearward and 273 pivots about the cylindrical shoulder on screw 271. The lower engaging lip 280 is moved forward to push pin 311 forward against the action of spring 313. As pin 311 moves forward, it carries camming block 317 with it. The camming surfaces 319 on camming block 317 slidably engages mating surface 321 on pivot block 299 and the pivot block is cammed outward. As the pivot block rotates about the upper pin 293, the outward movement of its lower portion carries safety finger 301 outward and clear of the rear portion of the trigger 82'. At this time, the trigger may be pulled rearward and the gun fired.

After the release of shoulder pressure from plate 203, the spring 209 retracts push rod 201 to its normal position. This retraction pivots crankshaft 223 and rod 259 is moved forward to its normal position. Spring 313 retracts pin 311 to its normal position, the head 315 of said pin engaging lower lip 280 of pivot arm 273 to return it to normal position. Spring 295 returns safety finger 301 to its normal position behind the trigger. The parts are thus restored into the safe position and are ready to again be moved to an armed position to permit firing on the application of shoulder pressure to the shoulder plate 203.

The instant invention may be adapted to provide an automatic safety for a gun having a hammer mechanism. For example, the embodiment illustrated in FIGURES 14 and 15 shows a hammer type gun, indicated generally at 331. The cheek side of the stock 341 has mounted thereon the identical type of cheek plate illustrated and explained in connection with FIGURE 4. Moreover, the elongated rod 75 is affixed to the cheek plate and rotatably mounted within bearings attached to the gun in exactly the same manner as for the embodiment of FIGURE 4. The hammer restraining safety finger 333 is affixed to the side of the gun by suitable screws and lies generally below the hammer. Its free upwardly extending portion passes over the top edge of the gun with its forward edge riding against guide pin 337. A cam 339 is fixedly mounted on elongated rod 75 just under safety finger 333 and positioned with respect thereto so that when rod 75 is rotated on inward movement of the cheek plate, the cam 339 will be carried with the rod and push the safety finger outwardly. Note that in the "safe" position, the finger is disposed with its free edge against guide pin 337 and its rear edge against and restraining the movement of hammer 343.

In operation, when the cheek plate of the embodiment

of FIGURES 14 and 15 is displaced by application of pressure from the shooter's cheek, the rod 75 rotates the cam 339 to move the safety finger 333 upwardly and outwardly, and clearing it from the path of the hammer 343. Then, on the pulling of the trigger, the hammer 343 may strike the firing pin 345 to fire the gun. Since the safety finger is of a springy metal and is deformed to set up a restoring force within it during the camming operation of 339 which forced it outward and upward to permit the forward movement of the hammer, it will be apparent that when the hammer is again returned to the firing position that the finger 333 will fall back into position with its rear edge against the forward portion of the hammer to restrain forward movement of the hammer until the safety is again actuated by application of pressure to the cheek plate to move the safety finger 333 clear for hammer action.

Having described the invention in connection with certain specific embodiments thereof, it is to be understood that further modifications may now suggest themselves to those skilled in the art and it is intended to cover such modifications as fall within the scope of the appended claims.

What is claimed is:

1. The combination with a gun having a tubular barrel and firing actuation means which move generally parallel to the longitudinal axis of said barrel to fire said gun, an automatic safety comprising:

- (a) an external finger attached to said gun, said finger being movable along a path generally transverse to the longitudinal axis of said barrel from a normal position to an armed position and having a firing actuation means engaging portion,
- (b) said firing actuation means engaging portion of said finger being in engagement with said firing actuation means when in said normal position to restrain actuation thereof,
- (c) said firing actuation means engaging portion of said finger being transversely displaced to position it out of engagement with said firing actuation means when in an armed position, and
- (d) biasing means urging said finger into the normal position.

2. The combination of claim 1 in which said gun has an elongate stock connected therewith including a butt end for engagement with a shoulder of a shooter and a cheek contact area on said stock, said movable actuation means comprise a hammer having an external portion on the upper regions of said gun, said external finger is attached to said gun below said external portion of said hammer to permit transverse movement with respect to the direction of movement of said hammer, said firing means engaging portion of said finger extends in front of and engages said external portion of said hammer when said finger is in a normal position but is pivoted outwardly clear of said external portion of said hammer when in an armed position, said biasing means comprising resilient material of construction of said external finger, said combination further comprising inwardly pivotal check contact plate means adjacent the cheek contact area on said stock and rod like means connected to said plate means for urging the said finger into an armed position when said plate means are pivoted inwardly.

3. The combination of claim 1 in which said movable actuation means comprise a depending trigger, said external finger is pivotally attached to said gun above said trigger for transverse movement with respect to the direction of movement of said trigger, and said firing means engaging portion extends behind said trigger when said finger is in a normal position but is pivoted outwardly clear of said trigger when in an armed position.

4. The combination of claim 3 in which a tab projects from said finger to facilitate movement of said finger from the normal to the armed position, said tab being disposed clear of said trigger and extending along the side of said

trigger corresponding to the side of said gun on which said finger is pivotally attached.

5. The combination of claim 3 in which said gun includes a barrel, an elongate stock connected therewith with a cheek area on a side thereof and a butt and further comprising an external actuating member operatively associated with said finger and extending from the proximity of said finger rearward toward the butt end of said stock, a pressure plate located beside the cheek area of said stock operatively connected to said external actuating member, a spring normally urging said pressure plate to an extended normal position but yieldingly permitting said plate to be moved to a depressed position, whereby pressure on said plate moves it to the depressed position, causing said finger to pivot to the armed position, and on release of pressure said spring returns said plate to the extended position and said finger then returns to the normal position.

6. In combination with a gun having a barrel, an elongate stock connected therewith including a butt end for engagement with the shoulder of a shooter and a cheek contact area on said stock, firing means, and a trigger for actuating said firing means when said trigger is pulled, a safety comprising:

- (a) a cheek contact plate adjacent the cheek area of said stock,
- (b) spring means resiliently urging said plate outwardly from said stock but yieldingly permitting inward movement on the application of pressure to said cheek plate,
- (c) an external pivotally mounted retainer finger riding behind said trigger when in a normal position, but pivotal outwardly into an armed position to clear the movement of said trigger and permit its actuation, and
- (d) a connecting rod secured to said gun running external thereof to operatively connect said plate with said trigger retainer finger to cause said finger to pivot from the normal to the armed position when said plate is moved inward.

7. In combination with a gun having a barrel, an elongate stock connected therewith including a butt end for engagement with the shoulder of a shooter and a cheek contact area on said stock, firing means, and a trigger for actuating said firing means when said trigger is pulled, a safety comprising:

- (a) a cheek contact plate adjacent the cheek area of said stock, said cheek plate being movably mounted with respect to said stock so that said plate may move inwardly from a normal position to a depressed position,
- (b) an external pivotally mounted retainer finger riding behind said trigger when in a normal position, but pivotal outwardly into an armed position to clear the movement of said trigger and permit actuation,
- (c) a connecting rod secured to said gun running external thereof to operatively connect said plate with said retainer finger to cause said finger to pivot from the normal to the armed position when said plate is moved inward, but permitting the movement of said finger into the normal position when said plate is in the normal position, and
- (d) means biasing said plate into the normal position but yieldingly permitting inward movement of said plate into the depressed position and biasing said retainer finger into the normal position to hold it in said normal position when said plate is in the normal position but yieldingly permitting the outward pivot of said finger into the armed position on movement of said plate into the depressed position, whereby the application of pressure to said cheek plate to move it to the depressed position clears said retainer finger from said trigger to permit it to be fired and on the release of such pressure from the cheek plate the retainer finger returns to a normal position restraining movement of said trigger.

11

8. The combination of claim 7 further comprising a pair of spaced apart bearings carried on said gun and in which said connecting rod is journalized, said means biasing said plate and biasing said retainer finger comprising a spring behind said plate, said connecting rod being engaged to said retainer finger and said plate so that said connecting rod rotates to cause said finger to pivot from the normal to the armed position when said plate is moved inwardly to the depressed position and rotates in on opposite sense to withdraw said finger from the armed position to the normal position when said cheek plate returns to the normal position under the action of said spring.

9. The combination of claim 7 wherein the means biasing said plate and biasing said retainer finger comprises first and second biasing means, said first biasing means comprising a spring urging said plate outwardly from said stock and said second biasing means comprising a separate spring biasing said retainer finger into the normal position.

10. The combination of claim 9 further comprising a bracket carried on said gun above said trigger, said retainer finger being pivotally mounted on said bracket, said bracket having bearing means rotatably supporting an end portion of said connecting rod, and an arm extending from said connecting rod adjacent said retainer finger for engagement therewith to force it to pivot outward when said rod is rotated by depression of said cheek plate.

11. The combination of claim 10 in which said stock has structure defining a cheek contact plate receiving recess including a lower shoulder, said combination further comprising a hinged member pivotally connecting said cheek contact plate and said shoulder, said spring urging said plate outwardly being disposed behind said plate and bearing against a surface of the structure defining said recess, whereby said plate moves inward into said recess when said plate is engaged.

12. The combination of claim 11 further including a felt-like cover for said face plate.

13. In combination with a gun having a barrel, and elongate stock connected therewith, and having a cheek side and opposite side, and with a butt end shaped for engagement with the shoulder of the shooter, firing means, and a trigger for actuating said firing means when said trigger is pulled, a safety comprising:

- (a) external trigger restraining means comprising a pivoted finger with a free end having a normal position with its free end restraining actuation of said trigger and having a retracted position with its free end pivoted clear of said trigger permitting actuation thereof,
- (b) forwardly movable shoulder plate means extending over the end of the butt of said stock and adapted for engagement with the shoulder of the shooter when raised to normal firing position,
- (c) a crank passing through said stock from the opposite side to the cheek side thereof,
- (d) external push rod means connected to said plate means adapted to move forward when said plate means is moved forward, said last named means being located on the opposite side of said stock and being operatively connected to said crank,
- (e) biasing means urging said shoulder plate means rearward, and
- (f) an actuating rod connecting said crank and said restraining means and movable by said crank to retract said restraining means from the normal position to the retracted position when said shoulder plate

12

is moved forwardly by shoulder pressure by a shooter.

14. The combination of claim 13 in which said biasing means comprise a spring carried by the stock of said gun and in which said combination further comprises a bracket mounted on the side of said gun, said trigger restraining means being pivotally carried on said bracket, spring means carried by said bracket and normally urging said trigger restraining means inwardly, a pivot block having a camming face, said pivot block being fixedly connected to said pivoted finger, and a camming block operatively associated with the end of said actuating rod, whereby said camming block cams said pivot block outwardly when said shoulder plate is moved forwardly to pivot said finger clear of said trigger and said spring means carried by said bracket returns said trigger restraining means to the normal position after said shoulder plate is returned to the normal position by the said spring carried by the stock of said gun.

15. In combination with a gun having a barrel, an elongate stock connected thereto having a butt end shaped for engagement with the shoulder of a shooter and a side with a cheek contact area adapted for engagement with a part of a shooter's head, firing means, and a trigger for actuating said firing means when said trigger is pulled, a safety comprising:

- (a) pivotal cheek plate means mounted adjacent to the side of said stock,
- (b) connecting means extending from said plate means,
- (c) restraining means operatively connected to said plate means by said connecting means restraining the trigger from firing movement when in a normal position but retracted to an armed position to permit firing movement of said trigger on pivoting of said plate means, and
- (d) secondary safety means restraining the movement of said plate means in a normal position but movable into an armed position to permit said cheek plate means to pivot.

16. The apparatus of claim 15 in which said secondary safety means further comprises a stop member which is intermediate said stock and said plate when said secondary safety means are in said normal position but which is moved clear of said plate by the application of an external positively applied force moving said secondary safety means to said armed position.

17. The apparatus of claim 16 in which said secondary safety means comprises a rearwardly biased, forwardly movable shoulder plate behind said butt end, a push rod connected to said shoulder plate, and a stop member operatively connected to said shoulder plate, said stop member normally lying between said plate means and said stock to restrain the pivot of said pivotal cheek plate means, but movable clear of said cheek plate means to permit the pivot of said cheek plate means when said shoulder plate is moved forward.

References Cited by the Examiner

UNITED STATES PATENTS

660,378	10/1900	Kalina	42—70
1,021,427	3/1912	Sagabiel	42—70
1,077,228	10/1913	Osborne	42—70
1,210,459	1/1917	Gile	42—70
2,401,034	5/1946	Young	42—70
2,525,886	10/1950	Fraser	42—70
2,625,765	1/1953	Magaro	42—70
2,635,380	4/1953	Baker et al.	42—70

BENJAMIN A. BORCHELT, *Primary Examiner.*

UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,222,809

December 14, 1965

Harvard J. Bryan

It is hereby certified that error appears in the above numbered patent requiring correction and that the said Letters Patent should read as corrected below.

Column 1, line 17, for "on" read -- "on" --; column 3, line 12, for "ttthe" read -- the --; line 51, for "31" read -- 21 --; column 5, line 29, for "field" read -- folded --; line 38, for "surfaces" read -- surface --; column 7, line 7, for "maybe" read -- may be --; line 30, for "check" read -- cheek --; column 8, line 58, for "FIGURE4" read -- FIGURE 4 --; line 60, for "atached" read -- attached --; column 9, line 59, for "check" read -- cheek --.

Signed and sealed this 18th day of October 1966.

(SEAL)

Attest:

ERNEST W. SWIDER

Attesting Officer

EDWARD J. BRENNER

Commissioner of Patents

UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,222,809

December 14, 1965

Harvard J. Bryan

It is hereby certified that error appears in the above numbered patent requiring correction and that the said Letters Patent should read as corrected below.

Column 1, line 17, for "on" read -- "on" --; column 3, line 12, for "tthe" read -- the --; line 51, for "31" read -- 21 --; column 5, line 29, for "field" read -- folded --; line 38, for "surfaces" read -- surface --; column 7, line 7, for "maybe" read -- may be --; line 30, for "check" read -- cheek --; column 8, line 58, for "FIGURE4" read -- FIGURE 4 --; line 60, for "atached" read -- attached --; column 9, line 59, for "check" read -- cheek --.

Signed and sealed this 18th day of October 1966.

(SEAL)

Attest:

ERNEST W. SWIDER

Attesting Officer

EDWARD J. BRENNER

Commissioner of Patents