

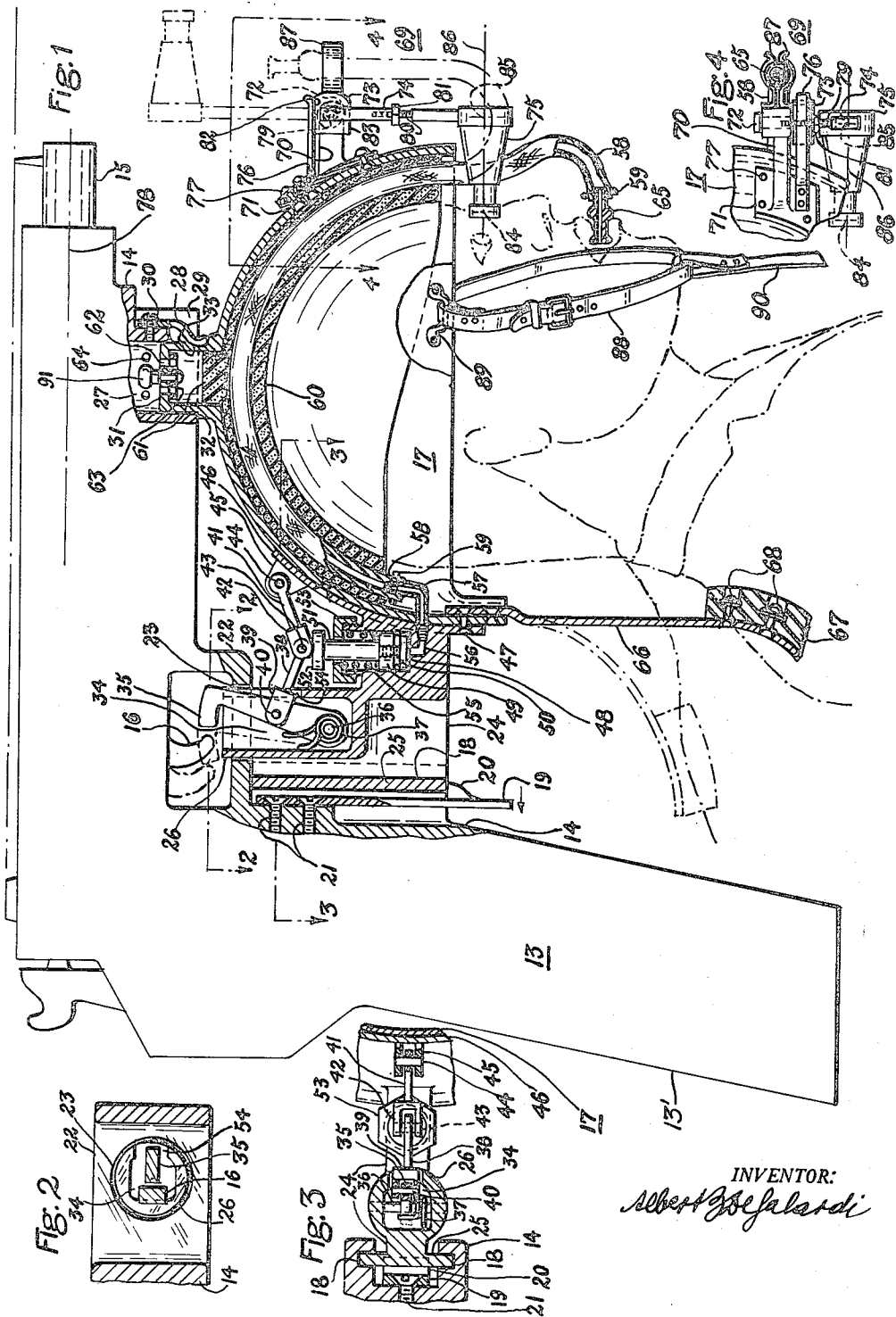
Sept. 15, 1953

A. B. DE SALARDI
HELMET MOUNTED PISTOL

2,651,872

Filed Feb. 14, 1949

3 Sheets-Sheet 1



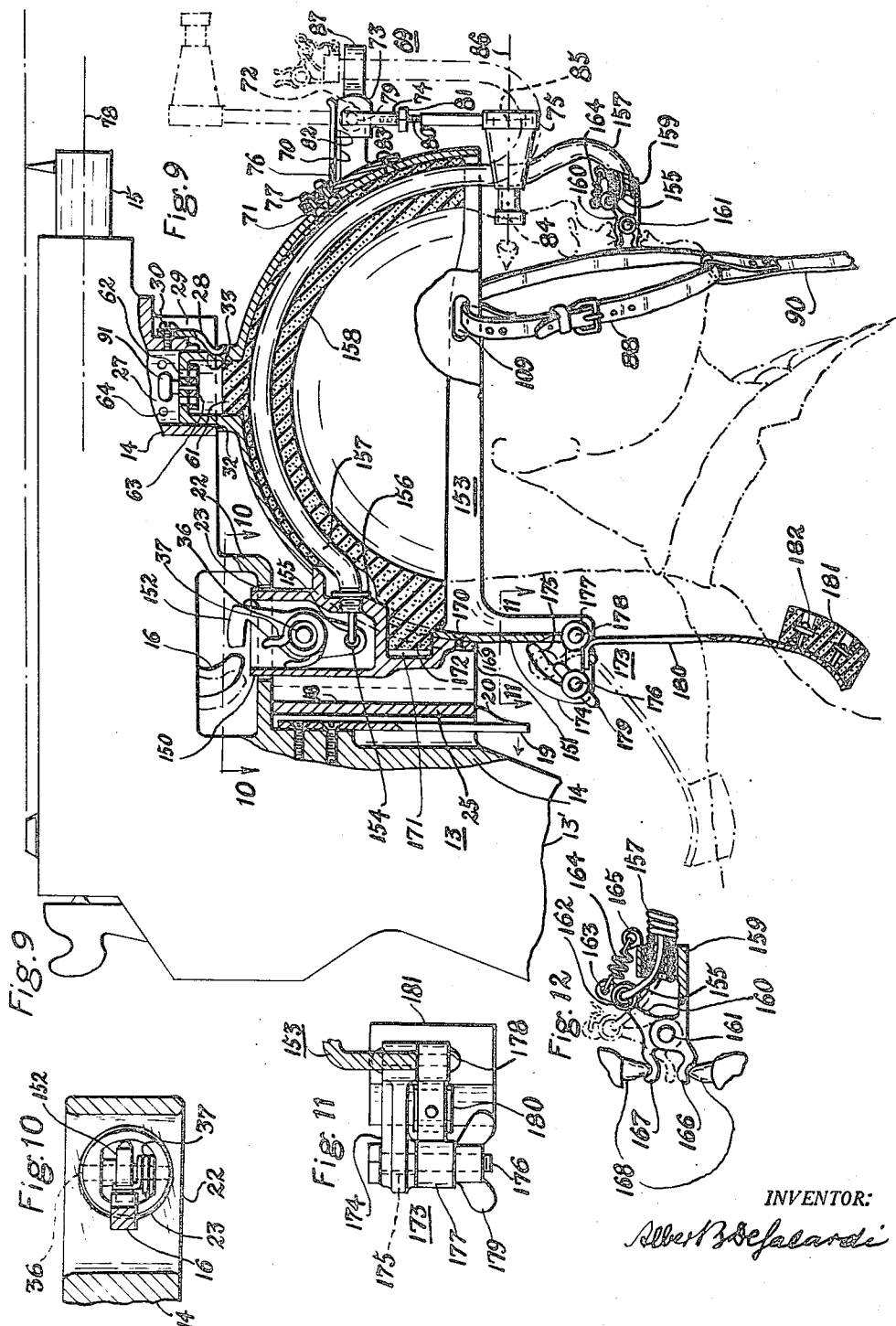
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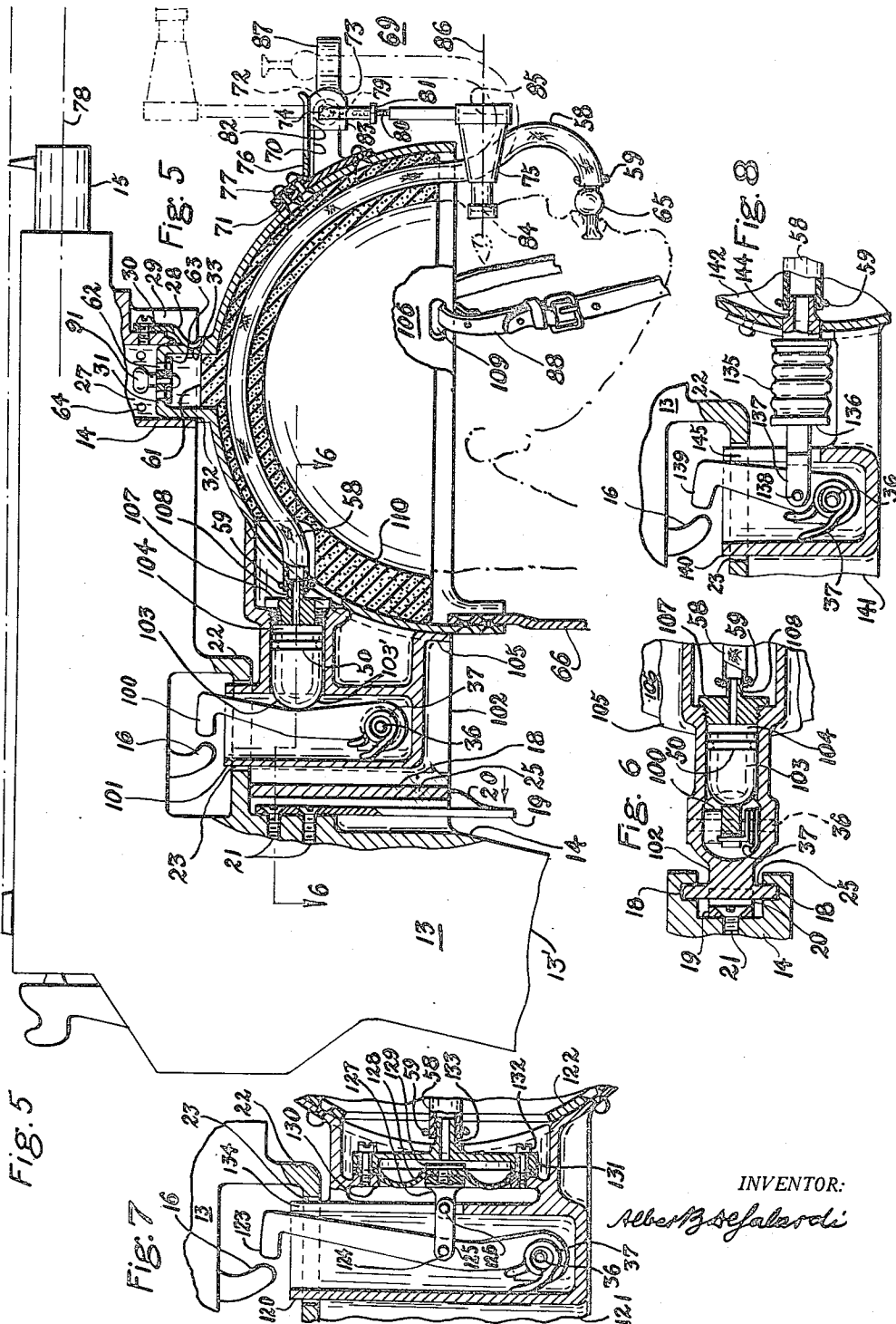
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UNITED STATES PATENT OFFICE

2,651,872

HELMET MOUNTED PISTOL

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8 Claims. (Cl. 42—1)

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This invention pertains to firearms such as self-loading pistols mounted upon the head gear or helmet of the wearer or operator.

Modern warfare requires activities and skills demanding full exercise of the coordinated mental and physical abilities of the fighting men. They have to carry, assemble and operate devices, advance and fight in quick succession if not simultaneously. In close combat the hands and arms of the fighter are occupied with the handling of the rifle, hence are not available for other activities such as cutting barbed wire, carrying and assembling equipment etc. As a consequence extra men are used for such activities reducing the number available for actual combat. Furthermore the mobility and speed of advancement of the troops is hampered by the stops and assumption of stationary positions necessary every time before a rifle can be aimed and fired.

My invention obviates these and other drawbacks and increases greatly the fighter's efficiency and success in combat by providing a helmet mounted gun which enables him to advance and simultaneously produce aimed and controlled gun fire without occupying his arms and hands which remain free to perform other needed tasks.

Police officers and prison guards at present cannot use their hands and arms, while pointing firearms, to subdue prisoners.

I achieve these and other objects by mounting a semi-automatic or automatic firearm such as an in itself complete, self loading pistol upon the head gear or helmet, providing the combination with reaction taking means for absorbing and distributing the reaction forces of the explosions in the gun to the bone- and muscle-structure of the wearer, employing an aiming device for pointing the gun at the target by suitable positioning of the wearer's head and operatively connecting it with fire control means responsive to muscular action upon organs of the wearer associated with his mouth.

In the following the words "gun" and "skull-cap" are used as synonymous of "pistol" and "head," respectively.

Hence one object of my invention is to provide a helmet mounted gun in which an automatic or semi-automatic firearm such as an in itself complete, with one hand operable self-loading pistol is rigidly but releasably fastened to an impact protective head gear or helmet in predetermined relative position that is entirely on the outer side of the supporting helmet so that the latter protects the wearer from the effects of explosion of the ammunition in the former.

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Another object is to provide a helmet mounted pistol employing an aiming device presenting an optical axis as determined by two aligning elements such as hair line crosses and/or sights carried by said aiming device and movable into the field of vision of the wearer which optical axis is in predetermined relationship with the axis of the barrel of the firearm so that pointing the former at the target by suitably moving wearer's head the barrel axis is also pointed substantially thereat with predetermined accuracy.

A further object is to provide a device of the character described in which the helmet is provided with means to start, stop, and maintain, respectively, firing of the gun by depressing or releasing the trigger thereof responsive to pressure developed or relaxed by muscular action of the wearer upon body organs associated with his mouth, such as contraction and expansion of the chest and closing, respectively opening of the jaws.

Another object is to provide a device set forth which employs firing control means including a pneumatic prime mover for depressing the trigger of the gun which prime mover is operated by gaseous matter expelled from the mouth of the wearer.

Still another object is to provide a helmet mounted gun employing firing control means including a diaphragm motor operated by the pressure of gaseous matter expelled from the mouth of the wearer by the action of his chest muscles.

Another object is to provide a helmet mounted pistol that employs firing control means including a pneumatic cylinder motor for depressing the trigger of the gun which cylinder motor is operated by gaseous matter expelled from the mouth of the wearer.

Another object is to provide a helmet mounted pistol which employs trigger control means including a flexible line controller operable by the pressure of the teeth developed by the jaw muscles of the wearer.

Another object is to provide a helmet mounted pistol carrying female and male coacting attachment means for rigidly and quickly mounting the gun upon the helmet in proper alignment with the aiming means and in cooperative position with the firing control means mounted on the helmet, said attachment means being associated with locking means including resilient means opposing the disengagement of the attachment means, whereby the assembly of the gun-member with the support-member is achieved by sliding them together along the attachment

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means, and the disassembly is effectuated by pulling them apart after deflecting the resilient locking means, in a similar fashion a bayonet is assembled with, respectively disassembled from a rifle.

A still further object is to provide a helmet mounted pistol which employs as the support of the pistol a helmet that encases substantially the skull-cap or head of the wearer with a relatively narrow radial gap occupied by reaction taking means such as a resilient lining, resilient bracing means and strap means for absorbing and distributing upon the bone- and muscle-structure of the wearer the reaction forces caused by the explosions in the gun.

Another object is to provide a device of the character described which is assembled in a bayonet-rifle fashion and is disassembled without detaching any fixed part from the device.

A further object is to provide a helmet operatively mounting on the outer side thereof a firearm in which the helmet encases substantially the skull-cap of the wearer and protects it from the effects of the explosion of the ammunition in said firearm.

Yet another object is to provide a helmet mounted gun which is simple in construction, reliable in operation, and inexpensive to manufacture.

The accomplishment of these and other objects will be evident to those skilled in the art when perusing this specification and the accompanying drawing in which:

Fig. 1 is the semi diagrammatic representation of the first preferred embodiment of my invention in side view, chiefly in median or central section, showing an automatic or semi automatic pistol fastened to the helmet by attachment means such as male and female coacting parts and resilient locking elements such as springs. These attachment means keep the pistol and helmet rigidly, but easily and quickly demountably, fastened together in operative position in which the longitudinal axis of the barrel of the gun is substantially aimed at the target at which the optical axis of the aiming means is pointed. The helmet is provided with a shock absorbing resilient lining, a resilient back-brace, chin strap and belt connector; through the resilient lining a flexible blow tube is laid conducting the gaseous matter expelled from the mouth of the wearer to an air cylinder the spring loaded piston of which coacts with a toggle mechanism to oscillate a finger lever acting upon the trigger of the pistol for depressing it and firing the pistol thereby. The aiming means and the bracket mounting it on the helmet is shown shifted from the near side half to the far side half of the helmet in order to show it in elevation for better understanding.

Fig. 2 is a partial sectional view taken on line 2—2 in Fig. 1.

Fig. 3 is a partial sectional view taken on line 3—3 in Fig. 1;

Fig. 4 is a partial plane view taken on line 4—4 in Fig. 1 and shows the aiming means such as a field glass and its adjustment and fastening to the helmet.

Fig. 5 is a side view, chiefly in median or central section, of the second preferred embodiment of my invention which differs from the first embodiment essentially only that the piston of the pneumatic cylinder acts directly upon the finger lever coacting with the trigger of the pistol for starting and maintaining fire. Also here the aim-

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ing means and its mounting bracket are shown shifted from the near- to the far side half of the helmet for the sake of clarity of the assembly.

Fig. 6 is a partial sectional view taken on line 6—6 in Fig. 5.

Fig. 7 is a somewhat enlarged fragmental side view, chiefly in section, of a modified form of the second preferred embodiment in which a pneumatic diaphragm motor is employed instead of the pneumatic cylinder.

Fig. 8 is the fragmental side view, chiefly in median or central section, of another modification of the second embodiment in which a bellows is used as a pneumatic prime mover.

Fig. 9 is a side view, chiefly in section, of the third preferred embodiment of my invention which differs essentially from the second embodiment in that the trigger control means comprise a flexible line controller consisting of a flexible line, wire or band guided for reciprocating motion in a stationary, flexible hollow conduit, the line being operated by a bell crank acted upon by the teeth pressed on by the jaw muscles of the wearer. The resilient back-brace is also modified showing a hinged, adjustable structure.

Fig. 10 is a partial cross sectional view taken on line 10—10 in Fig. 9;

Fig. 11 is a fragmental view to a somewhat enlarged scale, partly in section, taken on line 11—11 in Fig. 9;

Fig. 12 is a fragmental, somewhat enlarged elevational view of that end of the flexible line control which is acted upon by the teeth of the wearer.

In all the figures the pistol and some of the directly coacting parts of the helmet are shown to a larger scale than the helmet itself; the wearer is indicated by dot and dash lines.

Identical parts are designated by identical numerals of reference throughout the several figures of the drawing.

Referring closer to Figs. 1 to 4, illustrating the first preferred embodiment of my invention, the numeral 13 designates in general an automatic or semi automatic firearm such as a pistol, and the like of suitably light weight and relatively small dimensions and is adapted to be operated by one hand and loaded simultaneously with a relatively large number of cartridges to be fired in succession by depressing the trigger of the gun. The pistol member has its own inherent firing means which includes a trigger through which it is operated by the secondary firing means that are carried by the support-member. The internal mechanisms of such guns are well known and I do not need to describe or show these.

Gun-member, generally designated by 13 has pistol grip or handle 13', frame 14, barrel 15, trigger 16 and is fastened to a support-member constituting a helmet, generally designated by 17 and adapted to encase with relatively narrow radial gap the skull-cap of the wearer, by attachment means elements of which are integral with or rigidly fixed to, either the gun 13 or the helmet 17. I employ two groups of these attachment means (a) rearward attachment means and (b) forward attachment means, according to their locations. In the rearward group to gun 13 are fixed the following elements of the attachment means and locking means: groove 18, contained in frame 14, lockspring 19, carrying dog or stop 20, fastened by suitable means such as screws 21 to frame 14, and trigger guard 22 having a suitable aperture 23. To helmet 17 are rigidly fixed the following elements of the rearward

group of the attachment means: bracket 24 having laterally protruding guide shoe of substantially T cross section 25 slidably fitting into groove 18 and abutting the lower surface of the trigger guard 22 and engaging stop or dog 20 with its bottom surface when the gun member 13 is properly assembled with support member or helmet 17. Bracket 24 has a protruding preferably cylindrical hollow lug 26 the top of the outside surface of which slidably fits aperture 23 of trigger guard plate 22.

The elements of the attachment means and locking means in the forward group which are integral with, or rigidly fixed to, parts of the pistol are: cavity 27 in frame 14 and resilient lock means such as curved spring 28 accommodated in suitable slot 29 and held by suitable means such as one or more screws 30. The elements of the attachment means in the forward group which are rigidly fixed to, or integral with, helmet 17 are: hollow boss 31 slidably fitting into cavity 27, shoulder 32 and slot 33, both on boss 31, the latter for snugly receiving the end portion of curved spring 28 with suitable pressure to cause sufficient friction opposing disengagement.

The enumerated and described elements of the rearward attachment means are similar to those employed in fastening a bayonet to a rifle hence I refer to them collectively as "bayonet-rifle type engagement elements." Both rearward and forward attachment elements coact slidably with their cooperating parts, hence I refer to them collectively as male and female attachment means.

The attachment means on both pistol and helmet are shown to be arranged symmetrically to the vertical central plane through the axis of the pistol barrel dividing both, pistol and helmet, into left and right halves. It is, however, obvious that the attachment means may be asymmetrically arranged with respect to this central plane though the gun-member remains mounted centrally and substantially above the support-member or helmet.

By arranging the elements of the attachment means into two (rearward and forward) groups, each being in itself effective and spaced one from the other at a substantial distance which is preferably greater than the half length of the gun barrel the attachment is made rigid, accurate and the relative assembled position of gun and helmet practically identical in every instance of assembly.

Hollow lug 26 of bracket 24 forms an aperture 34 of suitable dimensions to accommodate oscillatably finger lever 35 fulcrumed by pin 36 and urged by resilient means such as torsion spring 37 forward, in the direction toward the helmet into its neutral, or ineffective position as shown in full lines. Toggle link 38 is oscillatably mounted on finger lever 35 by suitable means such as clevis 39 and fulcrum pin 40 at one end and its other end is hingedly connected to link 41 by approved means such as clevis 42 and fulcrum pin 43. Link 41 is oscillatably mounted by fulcrum pin 44 on bracket 45 fixed to flange 46 rigidly attached by suitable means such as rivets 47 to helmet 17.

Integral with, or rigidly attached to, flange 46 is a pneumatic prime mover having a stationary part, shown to be a pneumatic cylinder 48 having piston 49 as moving part reciprocally arranged therein, the latter being provided with suitable sealing means such as grommet 50. To pis-

ton 49 is rigidly but disconnectably fixed by suitable means such as threads piston rod 51 having a flat head 52 abutting clevis 42 of toggle link 41. Cylinder head 53, attached by threads or otherwise to pneumatic cylinder 48 has a suitable central hole through which piston rod 51 slidably reciprocates. A suitable slot 54 is provided in the hollow bracket portion 26 for accommodating finger lever 35, clevis 39, and toggle link 38. Compression spring 55, seated between cylinder head 53 and piston 49, urges the latter toward its neutral ineffective, or downward end position in which toggle links 38 and 41, due to the urge of torsion spring 37, are collapsed and finger lever 35 is in its forward ineffective, or neutral position. The positions of all the moving parts, shown in full lines in Fig. 1, are referred to as the neutral, ineffective or non firing positions of the respective parts in contradistinction to the effective or firing position, shown in dots and dashes. In the neutral position the orthogonal projection of finger lever 35 is within the projection of hollow bracket portion 26 so that former does not contact aperture 23 in trigger guard 22 and does not interfere therewith at the assembly of gun 13 and helmet 17. As best shown in Figs. 1 and 2 in the neutral position finger lever 35 is at a slight distance from the forward edge of trigger 16 of pistol-member 13.

Pneumatic cylinder 48 has a suitable duct 56 into which is sealingly fastened by pipe threads or other approved means suitably shaped nipple 57 to the protruding end of which flexible tube 58 is sealingly fastened by suitable means such as clamp 59. Tube 58 which is shown to be made from fabric reinforced rubber is inserted through a suitable duct in a resilient shock absorbing lining 60 of helmet 17 which lining has suitable thickness to occupy the relatively narrow radial gap between the inner surface of helmet 17 and the skull-cap of the wearer and snugly fits the inside surface of helmet 17.

The term "tubing" is used subsequently as synonym of "tube."

Lining 60 has means for frictional engagement for retaining it in contact with the inner surface of the helmet. Such engagement means are one or more projections 61 of lining 60 snugly fitting hollow bosses 31. Though I show only one hollow boss and one coating projection of lining 60 it is obvious that a plurality of them may be employed at corresponding locations of the helmet and lining for suitable frictional engagement. It is also plain that the cavities of the hollow bosses may be undercut and the lining projections outwardly expanding for locking lining 60 to helmet 17. Lining 60 is made from sponge rubber or similar material for obtaining greater resiliency and compressibility, better ventilation and distribution of shocks upon the skull of the wearer.

Hollow boss 31 is provided with perforations 62 and at its top rotatably mounts a perforated disk 63 which is turnable by knob 91 for selectively closing, opening, and regulating communication between lining and atmosphere to provide selectively adjustable ventilation through the pores of resilient lining 60 and holes 64 arranged in frame 14 of pistol 13.

To the forward end of tube 58 is sealingly attached mouth piece 65 fastened by known means such as clamp 59 to the tube and adapted to be held between the lips and/or the teeth of the wearer so that he may conveniently blow through it into tube 58 and cylinder 48 for operating piston

49, toggle links 38 and 41, finger lever 35 and trigger 16.

Resilient brace 66 is rigidly fixed to the back portion of helmet 17 protruding downwardly therefrom. It has, at its lower end portion a resilient pad 67 rigidly attached thereto by suitable means such as rivets 68. Brace 66 has suitable length and resiliency to press pad 67 toward the vertebral region of the body of the wearer and to permit him to assume standing or lying positions with helmet 17 operatively in place (see dot and dash lines in Fig. 1). Pad 67 is shown to be made of rubber but it may be from other resilient material.

The aiming means associated with helmet 17 and generally designated by 69 include bracket 70 having a flange 71, fulcrum pin 72, cam 73, adjustable angle lever 74, field glass 75 and flat spring 76. Bracket 70 protrudes forwardly from helmet 17 and carries fulcrum pin 72 having cam 73 rigidly fixed thereto. Angle lever 74 is rigidly attached by adjustable connections 79 and 80 of preferably threaded type and locked by jam nuts 81, to cam 73 and field glass 75, respectively. Cam 73 has two operative flat surfaces 82 and 83 which are contacted and pressed upon by flat spring 76, rigidly attached to flange 71, in the operative and non-operative positions, respectively, of field glass 75 as shown in full lines and in dot and dash lines in Fig. 1. Suitable positive stops (not shown) limit the oscillation of field glass 75 to the indicated end positions. The location and dimensions of the parts of the aiming means 69 are such that in the operative position, as shown in full lines, field glass 75 is aligned with one eye of the wearer so that the optical axis 86 of the aiming means 69 as presented by aligning means such as the hairline crosses 84 and 85 arranged in field glass 75 coincides with that of the aiming eye. As flange 71 is rigidly fixed by suitable means such as rivets 77 to helmet 17 which is rigidly attached to pistol 13 the optical axis 86 of the aiming means will be, as to direction and location, in a predetermined relationship with longitudinal axis 78 of pistol barrel 15. By properly setting and locking adjustable connections 79 and 80 accurate alignment of the aiming means with the eye of the wearer is obtained and by pointing the optical axis 86 at the target pistol barrel 15 is also substantially pointed thereat with predetermined accuracy.

Though I have shown field glass 75 as part of the aiming means it is obvious that it may be substituted by a skeleton structure providing hairline crosses 84 and 85 or their equivalents with or without lenses establishing optical axis 86.

Bracket 70 rigidly carries split resilient clamp 87 which is suitably dimensioned to receive and retain the end portion of tube 58 for storing it when it is not in use in a position ready for immediate employment. Field glass 75 is locked in both its operative and inoperative positions by the resilient pressure of spring 76 upon the respective operative flat surfaces 82 and 83 of cam 73. While I show the two end positions 180° apart it is plain that they may include another angle in which case the two operative flat surfaces of the cam will have to form a suitable angle with each other.

Means to prevent a rearward rotation of the helmet, due to the counterclockwise torque developed by the reaction of the explosions, is provided partially by the already described brace 66 and pad 67 and partially by adjustable chin strap 88 fastened by suitable strap engagement

means such as hasps 89 to helmet 17. Chin strap 88 is preferably tied by adjustable strap 90 to a belt (not shown) worn by the operator around his waist or chest for added security.

The first preferred embodiment of my invention operates as follows:

Pistol 13 is fastened to helmet 17 by sliding guide flange 25 into grooves 13 in frame 14 and moving the gun downwardly until the top of hollow lug 26 slides through aperture 23 in trigger guard plate 22 and dog 20 on spring 19 engages the bottom surface of bracket 24, simultaneously inserting hollow boss 31 into cavity 27 in frame 14 until spring 28 engages groove 33 on hollow boss 31. Chin strap 88 and strap 90 are adjusted and tightened, mouth piece 65 of flexible tube 58 is inserted between the lips and/or teeth of the wearer and the aiming means 69, previously adjusted by suitably setting screwed connection 79 and 80, is placed into operative position in which the optical axis of field glass 75 coincides with that of the aiming eye of the wearer.

To aim the pistol wearer tilts his head at an angle at which the optical axis 86 of field glass 75 is pointed at the target with a predetermined vertical and lateral allowance (depending upon the distance) thereby aiming longitudinal axis 78 of gun barrel 15 at the target with sufficient accuracy.

To fire pistol 13 the wearer, by contracting his chest muscles and emitting a blast of exhaled gaseous matter (used up air, carbon dioxide, water vapor, etc.) through the mouth piece 65, flexible tube 58, nipple 57 and duct 58 into pneumatic cylinder 48, forces piston 49 against the urge of spring 55 upward spreading thereby toggle links 38 and 41 which oscillate finger lever 35 against the pressure of torsion spring 37 into its rearward or effective position depressing trigger 16 into its firing position (shown in Fig. 1 by dot and dash lines). If pistol 13 is a semi automatic firearm for each discharge it will be necessary for the wearer to emit a separate blast for each shot successively depressing and releasing trigger 16 which, when released, is returned by the well known operating mechanism (not shown) of pistol 13 into its non-firing or neutral position. If pistol 13 is an automatic firearm, one blast, respectively one depression of trigger 16 will be necessary to fire the first shot and successive shots will follow as long as trigger 16 stays depressed by suitable pressure of gaseous matter maintained by the operator.

After the shooting is temporarily finished the operator swings the aiming means 69 about pin 72 counterclockwise into non-operative position away from his field of vision and slides the outer end of tube 58 into clamp 87 for convenient storage (shown in dot and dash lines in Fig. 1).

Figures 5 and 6 illustrate the second preferred embodiment of my invention which is very similar to the first except that the piston or moving part of the pneumatic cylinder or stationary part of the pneumatic prime mover acts directly upon the trigger depressing finger lever. Omitting the description of the parts identical with those used in the first embodiment, hence already described and designated by the same numerals, I describe now only the parts which are different hence referred to by different numbers.

Finger lever 100 is oscillatably mounted at its hub in the hollow lug 101 of bracket 102 by fulcrum pin 36 supporting torsion spring 37 that urges the finger lever forwardly against piston

103 reciprocally mounted in pneumatic cylinder 104 integral with bracket 102 and flange 105 rigidly fixed to helmet 106. The forward end of cylinder 104 is sealed by suitable means such as threaded tubular plug 107 having a projecting neck 108 to which flexible tube 58 is fastened. Piston 103 is provided with suitable sealing means such as one or more grommets 50. The rearward end of piston 103 is convexly curved forming a preferably spherical end portion 103' for slidably engaging finger lever 100. Helmet 106 has strap engagement means such as apertures 109 for engagement with chin strap 88. Shock absorbing lining 110 has a suitably shaped duct to accommodate flexible tube 58.

The operation of the second preferred embodiment is substantially the same as that of the first except that the gaseous pressure from the mouth of the wearer moves piston 103 and finger lever 100 against the urge of torsion spring 37 depressing trigger 16 into firing position.

Fig. 7 illustrates a modification of the second preferred embodiment consisting in substituting a pneumatic diaphragm motor for the pneumatic cylinder. The hollow lug 120 of bracket 121, rigidly attached to, or integral with, helmet 122, accommodates finger lever 123 which is oscillatably mounted therein from its neutral or ineffective position into its effective or firing position about pin 36 supporting torsion spring 37. Finger lever 123, hingedly mounts by pin 124 link 125 that is oscillatably connected by pin 126 to stem 127 to which the central portion of flexible diaphragm 128 is sealingly fastened by screw 129. Stem 127, screws 129 and diaphragm 128 compose the moving portion of the diaphragm motor constituting the pressure exerting means in this embodiment.

The peripheral region of diaphragm 128 is sealingly clamped between annular seat 130, integral with bracket 121, and cover 131 fastened to the seat by suitable means such as screws 132 and forming the stationary part of the diaphragm motor. Cover 131 has a forwardly protruding tubular portion 133 adapted to sealingly receive the end portion of flexible tube 58 fastened thereto by clamp 59. A suitable slot 134 is provided in hollow portion 120 of bracket 121 through which link 125 and stem 127 can reciprocate without interference.

The mode of operation of this modified form differs from that of the second preferred embodiment only that the gaseous matter expelled from the mouth of the operator is conveyed through tube 58 into the space between diaphragm 128 and cover 131 acting upon the substantially larger area of diaphragm 128 and exerting a correspondingly greater force upon finger lever 123 oscillating it rearwardly against the urge of torsion spring 37 depressing trigger 16 and thereby discharging gun 13. When the operator releases the pressure from his mouth into the atmosphere torsion spring 37 moves finger lever 123, link 125, stem 127 and diaphragm 128 into their forward, neutral or ineffective position.

Fig. 8 illustrates another modification of the second preferred embodiment in which a bellows is used instead of the pneumatic cylinder.

Bellows 135 has rearward plate 136 hingedly connected through clevis 137 and pin 138 to finger lever 139, oscillatably accommodated by pin 36 in hollow portion 140 of bracket 141 rigidly fastened to helmet 142. The forward plate of bellows 135 is rigidly fastened to helmet 142 and is provided with a tubular extension 144 adapted to sealingly

receive the end portion of tube 58 fastened thereto by clamp 59. Slot 145 in hollow lug 140 of bracket 141 permits clevis 137 to reciprocate therethrough.

The mode of operation of this modified form differs from that of the second preferred embodiment only in that the gaseous matter expelled from the operator's mouth expands bellows 135 and moves clevis 137 and finger lever 139 rearwardly, depressing trigger 16 for discharging pistol 13.

Figures 9 to 12 illustrate the third preferred embodiment of my invention which differs from the previously described ones chiefly in that the firing means consist of a flexible line controller operated by the jaw muscles of the wearer and the brace of the shock absorbing means is adjustable.

Avoiding description of the already disclosed parts I elaborate now only upon the new or modified elements designated by new numerals of reference.

Hollow lug 150 of bracket 151 accommodates in its suitably dimensioned cavity finger lever 152 which is oscillatably mounted by fulcrum pin 36 supporting torsion spring 37, that urges finger lever 152 forwardly toward the support-member or helmet, generally designated by 153. Finger lever 152 is double armed the upper arm acting upon trigger 16 and the lower having eye 154 which is engaged by flexible line, wire or band 155 that is led through a suitable ferrule 156, attached rigidly to bracket 151, and through flexible conduit 157 in a corresponding duct in resilient lining 158 forwardly, toward the mouth of the wearer. The inner end of flexible conduit 157 is rigidly fixed to ferrule 156 and the outer end to a terminal bracket 159 oscillatably mounting bell crank 160 fulcrumed by pin 161, as best seen in Fig. 10. The forward arm of bell crank 160 has two eyes 162 and 163; to eye 162 is fixed the outer end of flexible line 155 and into eye 163 is hooked the return spring 164 which also engages suitably located eye 165 on terminal bracket 159. The rearward extension 166 of terminal bracket 159 and the corresponding arm 167 of bell crank 160 are suitably curved to be securely engaged by the teeth 168 of the operator. Bracket 151 has a flange 169 which is rigidly fastened by suitable means such as rivets 170 to helmet 153. Hollow lug 150 of bracket 151 has an aperture 171 coacting with suitably dimensioned projection 172 of resilient lining 158 for increased retention by friction.

The bracing portion, generally designated by 173 of the reaction taking means carried by helmet 153 consists of rib 174 which is integral with, or rigidly fastened to, the helmet 153. Rib 174 carries arcuate slot 175 guiding screw 176 traversing arm 177 that is oscillatably mounted to rib 174 by pin 178. As best seen in Fig. 11 screw 176 is provided with wing nut 179 by which arm 177 is locked to rib 174 in any desired relative position.

Rigidly fastened to arm 177 is resilient brace 180 which is shown to be a flat spring mounting at its downward end portion resilient pad 181 made of sponge rubber or similar elastic material fastened thereto by any approved means such as rivets 182.

The mode of operation of this embodiment is similar to those previously described except that the depression of trigger 16 is done by the pressure of the contracting jaw muscles of the operator acting through his teeth upon the bell

crank and flexible line of the controller oscillating the finger lever. The resilient brace is set by loosening wing nut 179 and turning arm 177 about pin 178 sliding screw 176 in slot 175 into the desired position by rotating arm 177 and with it brace 180 and pad 181 to contact operator's back with the desired pressure in his assumed position. The aiming device 69 is the same as in the previously described embodiments.

Rib 174 may form an integral part of bracket 151 instead of being fixed directly to helmet 153. In all embodiments the female rearward attachment means are: aperture 23 in trigger guard 22 and groove 18 in frame 14 of pistol member 13; the male rearward attachment means are: hollow lugs 26 (Fig. 1), or 101 (Fig. 5), or 150 (Fig. 9) and guide shoe 25 protruding from brackets 24, 102 and 151 of support members 17, 106, and 153, respectively. The female forward attachment means is cavity 27 in frame 14 of pistol member 13, and the male forward attachment means is boss 31 protruding from each of the support members 17 (Fig. 1), 106 (Fig. 5) and 153 (Fig. 9).

In all the described embodiments the orthogonal projections of the finger lever in neutral position is within the projection of the hollow portion of the bracket in which it is accommodated. Hollow portions fit aperture 23, drawing exaggerating tolerance.

Metallic parts to be rigidly fixed to each other may have riveted, screwed, welded or braced construction or may be integral. The firing control means in all embodiments are operated by pressure developed by muscular action of the wearer upon body organs associated with his mouth such muscles being the chest muscles to produce compressed gaseous matter issuing from the mouth or the jaw muscles pressing the teeth upon the bell crank of the flexible line controller. Chest and jaws are associated with the mouth.

It will be noted that in all embodiments of my invention the gun-member has its inherent firing means which I call primary firing means and which includes a trigger and the support member carries the secondary firing means including oscillating lever means and pressure-exerting means. The secondary firing means act upon the trigger of the primary firing means depressing it into firing position.

In the operation of all embodiments the support-member or helmet, attached to the gun-member, increases their common mass thereby decreasing the velocity of the recoil and dampening its effects. The support-member, being positioned between the gun-member and the operator's head protects the latter from the effect of the explosions in the former.

The gun-member, being mounted outside of the support-member, is substantially visible and has a deterrent, surrender inviting effect upon an adversary.

Inasmuch the "primary firing means," inherent to the pistol member are well known and I claim no improvement relating to them, the expression "firing means" refers exclusively to the "secondary firing means," carried by the support member.

Having fully disclosed my invention and described and illustrated preferred embodiments thereof it will be understood that various changes and modifications may be resorted to by those skilled in the art without departing from the spirit and scope of my invention, hence I do not intend to be limited by the illustrated embodi-

ments but what I claim as new and wish to protect by Letters Patent is:

1. Helmet mounted pistol comprising a support member forming a helmet having a cavity for encasing substantially a human head and a pistol member being a complete repeating pistol operable as such by one hand without said support member and having a frame, a barrel, a handle, a trigger and a trigger-guard, slidably coacting female and male rearward attachment means and similarly cooperating forward attachment means, the former being located in the proximity of said trigger and including a bracket fixed to said support member and having a hollow, upwardly protruding lug, the latter being located adjacent to the forward portion of said barrel, resilient locking means tending to keep said female and male attachment means assembled, firing means, independent from and unattached to said pistol member and carried by said support member, said firing means including a finger lever mounted oscillatably between ineffective and effective positions substantially in said hollow lug and extending in its ineffective position close to the operative side of said trigger, pressure exerting means and resilient return means, both of which being carried by said support member and to both of which said firing means are responsive, said pressure exerting means being energizable by human muscular action and being resiliently opposed by said return means whereby the energized pressure exerting means oscillates said finger lever from its ineffective into its effective position depressing said trigger and firing said pistol member and said return means restores said firing means to its ineffective position when said pressure exerting means is deenergized, said attachment means fasten said pistol member entirely outside of said support member, free and visible in the atmosphere, said support member shielding the therein encased human head from the effects of firing said pistol member and preserving the moral effect thereof by total and prominent display of it, outside of said support member.

2. Helmet mounted pistol comprising a support member forming a helmet having a cavity for encasing substantially a human head and a pistol member being a complete repeating pistol operable as such by one hand without said support member and having a frame, a barrel, a handle, a trigger and a trigger-guard, slidably coacting female and male rearward attachment means and similarly cooperating forward attachment means, the former being located in the proximity of said trigger and including a bracket fixed to said support member and having a hollow, upwardly protruding lug, the latter being located adjacent to the forward portion of said barrel, resilient locking means tending to keep said female and male attachment means assembled, firing means, independent from and unattached to said pistol member and carried by said support member, said firing means including a finger lever mounted oscillatably between ineffective and effective positions substantially in said hollow lug and extending in its ineffective position close to the operative side of said trigger, pressure exerting means and resilient return means, both of which being carried by said support member and to both of which said firing means are responsive, said pressure exerting means are energizable by human mus-

cular action and being resiliently opposed by said return means whereby the energized pressure exerting means oscillates said finger lever from its ineffective into its effective position depressing said trigger and firing said pistol member and said return means restores said firing means to its ineffective position when said pressure exerting means is deenergized, said attachment means fasten said pistol member entirely outside of said support member, free and visible in the atmosphere, said support member shielding the therein encased human head from the effects of firing said pistol member and preserving the moral effect thereof by total and prominent display of it outside of said support member, said pressure exerting means including a pneumatic prime mover having a stationary part fixed to said support member and a moving part therein displaceable by the pressure of a gaseous medium, means operatively connecting said moving part to said finger lever, flexible tube means, at its near end sealingly fastened to said stationary part and at its far end provided with a mouth-piece adapted to be held in a human mouth, for conducting said gaseous medium expelled therefrom into said stationary part to displace said moving part in opposition to said return means.

3. Helmet mounted pistol comprising a support member forming a helmet having a cavity for encasing substantially a human head and a pistol member being a complete repeating pistol operable as such by one hand without said support member and having a frame, a barrel, a handle, a trigger and a trigger-guard, slidably coacting female and male rearward attachment means and similarly cooperating forward attachment means, the former being located in the proximity of said trigger and including a bracket fixed to said support member and having a hollow, upwardly protruding lug, the latter being located adjacent to the forward portion of said barrel, resilient locking means tending to keep said female and male attachment means assembled, firing means, independent from and unattached to said pistol member and carried by said support member, said firing means including a finger lever mounted oscillatably between ineffective and effective positions substantially in said hollow lug and extending in its ineffective position close to the operative side of said trigger, pressure exerting means and resilient return means, both of which being carried by said support member and to both of which said firing means are responsive, said pressure exerting means are energizable by human muscular action and being resiliently opposed by said return means whereby the energized pressure exerting means oscillates said finger lever from its ineffective into its effective position depressing said trigger and firing said pistol member and said return means restores said firing means to its ineffective position when said pressure exerting means is deenergized, said attachment means fasten said pistol member entirely outside of said support member, free and visible in the atmosphere, said support member shielding the therein encased human head from the effects of firing said pistol member and preserving the moral effect thereof by total and prominent display of it outside of said support member, said pressure exerting means including a diaphragm motor having a stationary part fixed to said support member and a moving diaphragm therein displaceable by the pressure of a gaseous medium, a linkage operatively connecting said

diaphragm to said finger lever, flexible tube means, at its near end sealingly fastened to said stationary part and its far end provided with a mouth-piece adapted to be held in a human mouth, for conducting said gaseous medium expelled therefrom into said stationary part to displace said diaphragm in opposition to said return means.

4. Helmet mounted pistol comprising a support member forming a helmet having a cavity for encasing substantially a human head and a pistol member being a complete repeating pistol operable as such by one hand without said support member and having a frame, a barrel, a handle, a trigger and a trigger guard, slidably coacting female and male rearward attachment means located in the proximity of said trigger and forming a bayonet-rifle type engagement between said members and including a bracket fixed to said support member and having a hollow, upwardly protruding lug and parallel with it also a guide shoe of substantially T-shaped section, an aperture in said trigger-guard slidably fitting the outside surface of said lug, a downwardly extending endwise open groove in said frame slidably receiving said guide shoe, slidably cooperating female and male forward attachment means located adjacent to the forward portion of said barrel and including a cavity in said frame, a boss upwardly protruding from said support member and slidably fitting into said last mentioned cavity, a slot in said boss, resilient locking means tending to keep said female and male attachment means assembled and including a flat spring mounted in said groove and provided with a dog engaging said guide shoe and a flat spring carried by said frame and engaging said slot in said boss, firing means, independent from and unattached to said pistol member and carried by said support member, said firing means including a finger lever mounted oscillatably between ineffective and effective positions substantially in said hollow lug and extending in its ineffective position close to the operative side of said trigger, pressure exerting means and resilient return means, both of which being carried by said support member and to both of which said firing means are responsive, said pressure exerting means being energizable by human muscular action and being resiliently opposed by said return means whereby the energized pressure exerting means oscillates said finger lever from its ineffective into its effective position depressing said trigger and firing said pistol member and said return means restores said firing means to its ineffective position when said pressure exerting means is deenergized, said attachment means fasten said pistol member entirely outside of said support member, free and visible in the atmosphere, said support member shielding the therein encased human head from the effects of firing said pistol member and preserving the moral effect thereof by total and prominent display of it outside of said support member.

5. Helmet mounted pistol according to claim 2 in which said stationary part of said pneumatic prime mover is a cylinder and said moving part is a piston reciprocably mounted therein, said linkage includes toggle levers and said return means includes springs urging said finger lever and said piston toward their ineffective positions.

6. Helmet mounted pistol according to claim 4 in which said pressure exerting means includes

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a pneumatic prime mover having a stationary part fixed to said support member and a moving part operatively connected to said finger lever, said moving part being displaceably mounted in said stationary part and being responsive to the pressure of a gaseous medium, flexible tube means, at its near end sealingly fastened to said stationary part and at its far end provided with a mouth-piece adapted to be held in a human mouth for conducting said gaseous medium expelled therefrom into said stationary part to displace said moving part in opposition to said return means.

7. Helmet mounted pistol according to claim 4 in which said pressure exerting means includes a diaphragm motor having a stationary part affixed to said support member and a moving diaphragm therein displaceable by the pressure of a gaseous medium, a linkage operatively connecting said diaphragm to said finger lever, flexible tube means, at its near end sealingly fastened to said stationary part and at its far end provided with a mouth-piece adapted to be held in a human mouth, for conducting said gaseous medium expelled therefrom into said stationary

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part to displace said diaphragm in opposition to said return means.

8. Helmet mounted pistol according to claim 4 in which said pressure exerting means include a flexible conduit fixed at its near end to said support member, a bell crank carried by said conduit at its far end, a flexible line reciprocally mounted in said conduit and hingedly connected at one end to said finger lever and at the other end to said bell crank adapted to be operated by human jaws whereby pressure on said bell crank oscillates said finger lever from its ineffective position into its effective position depressing said trigger and firing said pistol member.

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