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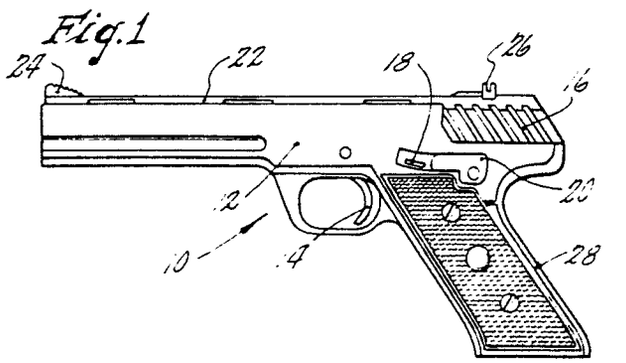
(54) Automatic pistol.

(57) A semiautomatic pistol has a frame defined by a stamping having two sections A barrel is mounted upon a tubular portion of the frame. A breech slide is mounted upon the barrel for reciprocating movement between battery and recoil positions. The barrel and breech slide are encased in a shell which includes a charging handle. A slotted pulling bar interconnects the charging handle and the breech slide so as to permit charging movement of the handle and also reciprocating movement of the breech slide during firing operation of the pistol without movement of the handle. The frame arrangement foster economical manufacture and the encasement by the shell of the reciprocating breech slide prevents diversion of a user's attention from a target.



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AUTOMATIC PISTOL

Technical Field

This invention relates to automatic pistols.

Background Art

Conventional automatic pistols generally incorporate frames made from a metallic casting or a forging. While such frames can obviously adequately perform their intended functions, they are expensive to manufacture and machine. In addition, conventional automatic pistols embody external moving parts such as a slide or hammer which can be distracting to a shooter when aiming at a target.

Disclosure of Invention

In accordance with the invention there is provided an automatic pistol which utilizes a frame defined by a metal stamping, thereby facilitating manufacturing and cost reduction. Upon the frame various subasssemblies are mounted to thereby form a complete firearm. The frame and associated assemblies are encased in a shell or housing which covers all moving parts during operation save for the trigger.

The invention further includes the provision of a breech slide or bolt-carrier assembly which reciprocates within the confines of the housing without exposted moving parts thereby not divert a user's attention from a target. A rearwardly located charging handle is displaced over a users hand to place a round in the chamber only when necessary.

Accordingly, it is a primary object of the invention to provide an automatic pistol having a frame comprised of a metallic stamping.

Another object is to provide an automatic pistol in which the breech-slide moves within a housing during pistol operation.

These and other objects and advantages of the invention will become more readily apparent from the following detailed description when taken in conjunction with the accompanying drawings, in which:

Brief description of Drawings

FIGURE 1 is a left side elevational view of a semiautomatic pistol according to the invention.

FIGURE 2 is a perspective view of the pistol of FIGURE 1.

FIGURE 3 is a left side elevational, sectional view of the pistol of FIGURE 1.

FIGURE 4 is a fragmentary, top plan, sectional view of the pistol of FIGURE 1, taken substantially along the line 4-4 of FIGURE 3.

FIGURE 5 is a fragmentary, right side elevational view , partly in section, of the pistol of FIGURE 1.

FIGURE 6 is a fragmentary, top plan, sectional view of the pistol of FIGURE 4, taken substantially along the line 6-6 of FIGURE 5.

FIGURE 7 is a rear elevational view of the pistol, taken substaantially along the line 7-7 of FIGURE 5.

FIGURES 8 and 9 illustrate the keying arrangement between the bolt and bolt carrier.

FIGURE 10 is a perspective view of the frame, per se.

FIGURES 11 and 12 are respective right and left side elevational views of the frame, per se.

FIGURES 13 and 14 are respective views of the frame, taken substantially along the lines 13-13 and 14-14 of FIGURE 11.

Best Mode of Carrying Out The Invention

Turning now to the drawings, wherein similar numerals refer to similar parts throughout the several figures, an illustrative firearm, in the form of an semiautomatic pistol of the blowback type, is depicted. With reference to FIGURES 1 and 2, there is shown a semiautomatic pistol 10 having a shell or housing 12 which encloses virtually all moving parts. As shown in FIGURES 1 and 2, the pistol 10 comprises a trigger 14, a charging handle 16 which constitutes part of the shell and is movable relative thereto, a bolt stop 18 and a manual safety 20. A sight bar 22, mounted upon the shell 12, carries a front sight 24 and a rear sight 26. The shell 12 also embodies a handle 28 to which suitable grips may be secured.

Referring to FIGURES 3-6, where certain aspects of the pistols'construction may best be appreciated, it will be noted that pistol 10 comprised a frame, generally indicated at 30, to which all major assemblies and shell 12 of the pistol are attached. Frame 30 is the heart of the pistol and is depicted, per se, in FIGURES 10-14. In general, the frame 30 may be regarded as being constituted by a front portion 32, a mid-portion 34 and a rear portion 36.

A barrel 38 fits snugly in a tubular section 40 (See FIGURES 3, 10, 13 and 14) of the frame 30 and is brazed thereto so as to be confined thereby

in all transverse directions and held against rotary and longitudinal displacement. The barrel 38 has a longitudinal rifled bore 42 extending from the front end thereof to a chamber 42A. Barrel 38 also embodies a beveled surface 44 longitudinally offset from a beveled surface 46 on the tubular section 40. The beveled surfaces 44 and 46 together define a feed throat for guiding a cartridge 48 stripped from a magazine (not shown) into position in chamber 42A. The front of the barrel 38 is threaded to receive a barrel nut 50 thereupon, which, in turn, is fitted within a muzzle plate 52 extending over and received within the opening at the front of the shell 12. As will be seen in FIGURE 3, the nut 50 and muzzle plate 52 embody frustroconical surfaces to firmly anchor the muzzle plate with respect to the shell.

With reference to FIGURES 3, 5, and 6, a bolt carrier assembly or breech slide, generally shown at 54, is mounted upon the barrel 38 for reciprocating movement between forward (battery) and rearward (recoil) positions. The breech slide or bolt carrier assembly 54 generally comprises a bolt 56, a carrier 58, a striker 60 and a cartridge extractor 62. A pin 64 extends through registering holes in the bolt 56 and the carrier 58 to join the two components in a rigid fashion so as to form an integral structure. As shown in FIGURES 3 and 5, the carrier 58 extends beyond the front of the bolt 56 and includes an overhanging barrel-mounted guide 66 having an aperture which closely conforms to the outer periphery of the barrel to guide the reciprocating movements of the bolt carrier assembly 54. An operating spring 68 is coiled around the barrel 38 and seats against the guide 66 to drive the bolt carrier assembly forwardly after recoil into battery position.

Bolt 56, which is contained within the elongated passage in the bolt carrier 58, has an internal cylindrical, longitudinal passage 70 which has a rearward opening and communicates with an aperture 72 at the front end thereof. In addition, the bolt 56 includes a longitudinal slot 73 (FIGURE 6) in its base which provides access to passage 70 from the lower exterior of the bolt 56. Within the passage 70, the striker 60 is mounted for longitudinal reciprocating movement relative to the bolt 56. Striker 60 is cup-shaped and is formed with a firing pin or extension 74 on its front end (the function of which is to protrude through the aperture 72) and is capable of striking the rim of the cartridge 48 when the bolt carrier assembly 54 is in the battery position and the trigger is pulled. A compression spring 76 is disposed within the striker to impel the striker toward the cartridge upon release thereof. The spring 76 is coiled about an extension 78 in the rear portion 36 of the frame 30 and bears against a seat 80 positioned thereupon. It will also be seen that the seat 80 performs a dual function in that it engages the wall of passage 70 to provide further guidance to the reciprocating movements of the bolt carrier assembly 54. A depending projection 82 on the striker 60 extends into the slot 73 for reciprocating travel therewithin. The projection 82 has a searing surface thereupon for engagement by a hooked portion 84 of an L-shaped sear, generally indicated at 86.

In order to initially chamber a cartridge in chamber 42A, the charging handle 16 is provided. Charging handle 16 incorporates two tracks (not shown) which are respectively slidable within two slots (not shown) in a plastic backstrap portion 88 of the shell 12 for guiding the rearward and forward movement of the charging handle 16. Fixedly attached to the charging handle 16 is a bar 90 having a slot 92 in which the pin 64, that joins the bolt 56 and bolt carrier 58, is received. When the charging handle 16 is pulled rearwardly, the bolt carrier assembly 54 also moves rearwarldly by virtue of the engagement between the forward end of the slot 92 and the pin 64. Upon releasing the rearward force upon the charging handle 16, the bolt carrier assembly will move forwardly into battery position (while stripping a cartridge form the magazine) under the impetus of the operating spring 68 and simultaneously pull the charging handle 16 back to its original forward or illustrated position.

During reciprocating movement of the bolt carrier assembly 54, the pin 64 merely slides back and forth within the slot 92 of the bar 90 without imparting any motion whatsoever to the charging handle 16 which remains stationary. Hence, all motion of the bolt carrier assembly 54 remains within confines of th shell or housing 12 and, of course, the charging handle 16. Since the pin 64 may be subjected to deleterious stress upon the bolt carrier assembly's engagement with the barrel as it moves into battery position or recoil therefrom, the bolt 56 and the carrier 58 are preferably keyed together to alleviate such stresses. FIGURE 8 shows key 94 being inserted in suitable confronting recesses in the bolt 56 and the carrier 58. FIGURE 9 shows the location of the key 94 after the carrier 58 has been moved in the direction of the arrow relative to the bolt 56. The pin 64 is inserted after the bolt 56 and carrier 58 are placed in the relative positions shown in FIGURE 9.

The Bolt 56 is furnished with the usual cartridge extractor 62 to retain a spent cartridge casing from the chamber 42A on the face of bolt 56 during recoil. The barrel 38 is relieved at 96 (FIGURE 6) and the tubular section 40 of the frame 30 embodies a clearance notch 98 (FIGURES 10, 11 and 14) to allow for positioning of the extractor 62. During recoil, a spent cartridge in the grasp of the extractor 62 contacts a cartridge ejector finger

100 on the frame, as best shown in FIGURES 10-13, whereupon the spent cartridge is expelled via an ejection window 102 as shown in FIGURE 2.

Referring to FIGURES 3,4,5 and 7, the sear 86 is mounted upon the frame 30 for pivoting movement by means of a pin 104 which extends through an aperture 106 in the rear portion of frame 30. Sear 86 has a lateral tab 108 on its vertical leg 110 which is adapted to be engaged by a trigger bar, generally designated 112 in FIGURES 3 and 5, for pivoting the sear in a counterclockwise direction (as viewed in FIGURES 3) to release the striker 60. A tension spring 114, having one end secured to a post 116 and the other end secured to vertical leg 110, furnished a clockwise spring bias to the sear 86 to maintain the hooked portion 84 in engagement with the searing surface of the striker 60.

A trigger assembly, as best shown in FIGURES 3,4,5 and 7, is formed by the trigger 14, a trigger guard 118 and the trigger bar 112. The trigger guard 118, per se, is hung upon depending feet 120 and 122 on the frame 30. The trigger 14 is mounted for pivoting movement upon a bushing 124 which is carried by a pin 126 extending completely through the shell 12 as shown in FIGURE 4. The pin 126 passes through an aperture 128 in the frame 30 as depicted in FIGURE 12. As shown in FIGURE 5, the trigger 14 has a lug 130 disposed in a notch 132 in the trigger bar such that depression of the trigger causes a rearward axial movement of the trigger bar and release of the trigger allows for trigger return.

The trigger bar 112 has a vertical post 133 to which is connected an end of a tension spring 134. The other end of the tension spring is connected a laterally extending mounting post 136 (FIGURES 5 and 11) on the frame 30. The rear end 138 of the trigger bar 112 is of an enlarged width and L-shaped as viewed in rear elevation (FIGURES 5,4 and 7) to provide an upper surface 140 to be engaged by a disconnect cam surface 142 on bolt 56 and a lower tab 144 to engage the confronting tab 108 on the sear and engender pivoting thereof. As FIGURE 5 reveals, the spring 134 applies a forward bias, as well as a clockwise bias (about lug 130), to the trigger bar 112 such that trigger return is constantly urged and the surface 140 is always in contact with the bolt 56. It should be readily apparent that, upon recoil, the trigger bar 112 will rotate a few degrees in the counterclockwise direction due to the engagement between cam surface 142 and the trigger bar surface 140. Such rotation will disengage the tabs 108 and 144, thereby allowing the sear 86 to pivot back to its original position wherein the hooked portion 84 can engage and retain the striker 60 in cocked position during counterrecoil of the bolt carrier assembly 54. To again fire the pistol, the trigger 14 must be released to allow the trigger bar 112 to axially move forwardly so that it can clear the sear 86 and snap upwardly to the position of FIGURE 5 where it can again displace the sear 86 during rearward axial movement.

Referring to FIGURE 3, the bolt stop 18 is pivotally mounted upon the bushing 124 and is spring loaded in a clockwise direction by a compression spring 146 seated upon the end of bolt stop 18 and the trigger guard 118. The Bolt stop 18 has a tang 148 which is adapted to engage the front of the bolt 56 to terminate counterrecoil movement when the magazine (not shown) is empty. The magazine follower 150 (shown in phantom) engages a leg 152 on the bolt stop 18 to urge pivoting of the bolt stop 18 counterclockwise such that the tang 148 may engage and stop the bolt carrier assembly 54. In order to release the bolt carrier assembly 54 for further counterrecoil movement to battery position, a thumb piece 154 is provided to permit a user to pivot the bolt stop 18 clockwise as shown in FIGURE 4.

As shown in FIGURES 3 and 7 the manual safety 20 comprises a safety lock plate 156 mounted upon a pivot pin 158 contained within an aperture 160 (FIGURES 5 and 10) in the frame 30. the plate 156 has a disconnect pin 162 projecting laterally therefrom and extending through a slot 164 in the frame 30. The disconnect pin 162 is slideable over a spring 166 mounted upon the frame and having a protrusion which extends into the slot 164. The protrusion on the spring 166 serves to position the lock plate 156 either in a safe or a fire permitting position. When in the safe position the disconnect pin 162 engages the tab 144 to hold the trigger bar 112 down whereby the sear 86 cannot be displaced. A thumb piece 168 permits a user to move the lock plate 156 between its safe and fire permitting positions (See FIGURES 4 and 7).

A pistol of the invention is advantageous since the frame thereof, which is best shown in FIGURES 10-14, may be formed by metal stampings, thereby occasioning cost savings. Frame 30 is preferably constituted by right and left stamping sections 30A and 30B, respectively. In order to join the two sections, only a few (e.g., three) spot welds are required. As illustrated in FIGURES 10-14, stamping section 30A is the longer of the two sections and embodies the rear portion 36 and the forward mounting post 136. The cartridge ejector 100 is formed as part of the stamping section 30B. Both stamping sections, of course, include complementary sections which define the magazine receiving mid-portion 34 and the tubular portion 40.

In operation, when the trigger 14 is pulled, the sear 86 pivots downwardly or counterclockwise (see FIG.3) such that there is disengagement be-

tween the sear 86 and the striker 60. The striker 60 then moves forwardly (sliding within the bolt 56 under the impetus of its spring until the firing pin 74 attached thereto strike the rim of a chambered cartridge 48. The striker 60 is now in its forward position. The ejector 100 never moves and remains fixedly positioned during recoil and counterrecoil with respect to the pistol frame 30.

The illustrated pistol 10 is blowback (not gas) operated; and the gas pressure within the cartridge case will drive the bolt 56 and carrier 58 rearwardly after it is fired, with the case being in the grasp of the extractor 62. The cartridge ejector 100 then contacts the rearwardly moving cartridge case, thereby resulting in its ejection from window 102.

After recoil, counterrecoil commences under the influence of the operating spring 68. However, during the counterrecoil stroke, the sear 86 will engage and stop movement of the striker 60 because the trigger bar 112 will have been pivoted downwardly (during recoil) by the cam surface 142 such that bar 112 cannot engage the sear 86. The sear spring 114 then will urge the sear 86 in a counterclockwise direction (see FIG. 5), whereby the sear 86 will engage the striker 60 on the counterrecoil stroke of the bolt 56 and bolt carrier 58. During further counterrecoil of the bolt 56 and carrier 58, the striker spring 76 will be compressed and, of course, a new round will be stripped from the magazine (not shown) and inserted in the chamber. To again fire the pistol, the trigger 14 must be released to allow the trigger bar 112 to axially move forwardly so that it can clear the sear 86 and snap upwardly to a position where it can again displace the sear 86 during rearward axial movement. In this latter regard, it will be seen that, in FIG. 5, the bar 112 and trigger 14 are in their respective forward positions.

Before initial firing, it is, of course, necessary to charge (chamber a round) the pistol 10. This is effectuated by means of the charging handle 16. When the handle is pulled rearwardly, the slotted pulling bar 90, which has the bolt-carrier pin 64 received in its slot, pulls the bolt carrier assembly 54 rearwardly. During rearward pulling against the operating spring 68, the striker will not move and the bolt 56 will slide over the striker 60. Releasing the charging handle 16 for forward movement will allow the bolt carrier assembly 54 to move forwardly under the bias of the operating spring 68 such that a cartridge is stripped from the magazine and chambered. Again, the bolt 56 slides over the striker 60 which is held in place by the sear 86. During normal firing of the pistol, the charging handle 16 does not move during recoil or counterrecoil as the bolt-carrier pin 64 travels rearwardly and subsequently forwardly within the slot 92 in the pulling bar 90. Therefore, nothing slides exteriorly of the pistol 10 during operation.

Obviously, many modifications and variations are possible in light of the above teachings without departing form the scope or spirit of the invention as defined in the appended claims.

Claims

1. An automatic pistol comprising:
a stamping defining a frame;
a barrel mounted upon the stamping;
a breech slide mounted upon the barrel for reciprocating movement between battery and recoil positions; and
a shell mounted upon the frame in fixed relationship thereto such that it covers at least a portion of the barrel and the breech slide.

2. The pistol of claim 1, wherein the shell comprises a charging handle and wherein the pistol further comprises:
means to connect the breech slide to the charging handle such that the charging handle may pull the breech slide rearwardly and allow for reciprocating movement of the breech slide relative to the charging handle whereby no movement is imparted thereto.

3. The pistol of claim 2, wherein the breech slide comprises:
a pin; and wherein the connecting means comprises:
a pulling bar, having a slot therein, connected to the charging handle, the pin being received within the slot.

4. The pistol of claim 3, wherein the breech slide comprises:
a bolt;
a carrier, the carrier being mounted upon the barrel and the bolt being received in the carrier and joined by the pin; and wherein the pistol further comprises:
an operating spring in surrounding relationship to the barrel and interposed between the stamping and the carrier.

5. The pistol of claim 4, wherein the stamping comprises:
a tubular portion, the barrel being mounted in the tubular portion and the operating spring being seated against the tubular portion.

6. The pistol of claim 1, wherein the stamping comprises:
a right stamping section; and
a left stamping section joined to the right stamping section.

7. The pistol of claim 1, further comprising
a trigger pivotally mounted upon the stamping;
a trigger bar connected to the trigger such that rearward and forward movements of the trigger

result in corresponding movements of the trigger bar:

a sear pivotally mounted upon the frame adapted to be engaged and pivoted by the trigger bar; and wherein the breech slide comprises:

a striker having a searing surface, for striking and firing a chambered cartridge in the barrel, the sear being adapted to engage the searing surface and be disengaged from the searing surface when pivoted by the trigger bar.

8. The pistol of claim 7, wherein the stamping comprises:

an extension; and wherein the pistol further comprises:

a striker spring mounted upon the extension in engagement with the striker for displacing the striker relative to the breech slide.

9. The pistol of claim 1, wherein the breech slide comprises:

a cartridge extractor for withdrawing a spent cartridge casing from the barrel; and wherein the stamping comprises:

a cartridge ejector for contacting and ejecting the spent cartridge casing during recoil of the breech slide.

10. In an improved semiautomatic pistol of the type having a frame, a barrel mounted upon the frame, a breech slide mounted for reciprocating movement relative to the frame between battery and recoil position, the improvement comprising:

a shell encasing at least a portion of the barrel and the breech slide, a rear portion of the shell defining a charging handle moveable with respect to the remaining portion of the shell; and

means to connect the breech slide to the charging handle such that the charging handle may pull the breech slide rearwardly and allow for reciprocating movement of the breech slide within the shell without imparting movement to the charging handle.

11. The pistol of claim 10, wherein the connecting means comprises:

a pulling bar connected to the breech slide and the charging handle.

12. The pistol of claim 11, wherein the breech slide comprises a pin and the pulling bar comprises a slot which receives the pin for movement therein during reciprocation of the breech slide.

13. The pistol of claim 12, wherein the improvement further comprises:

the frame being formed by a stamping having a tubular portion which receives the barrel and the breech slide being mounted upon the barrel.

Fig.1

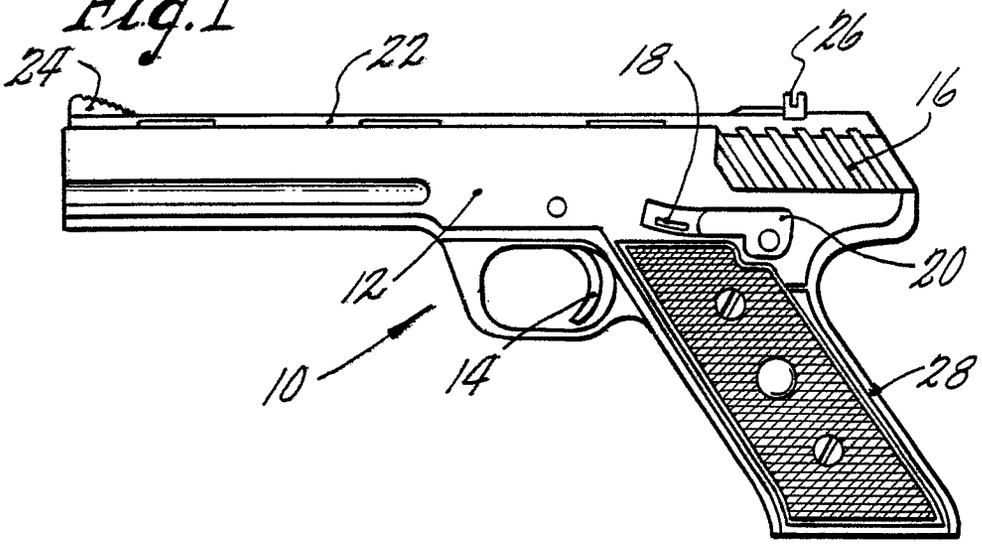
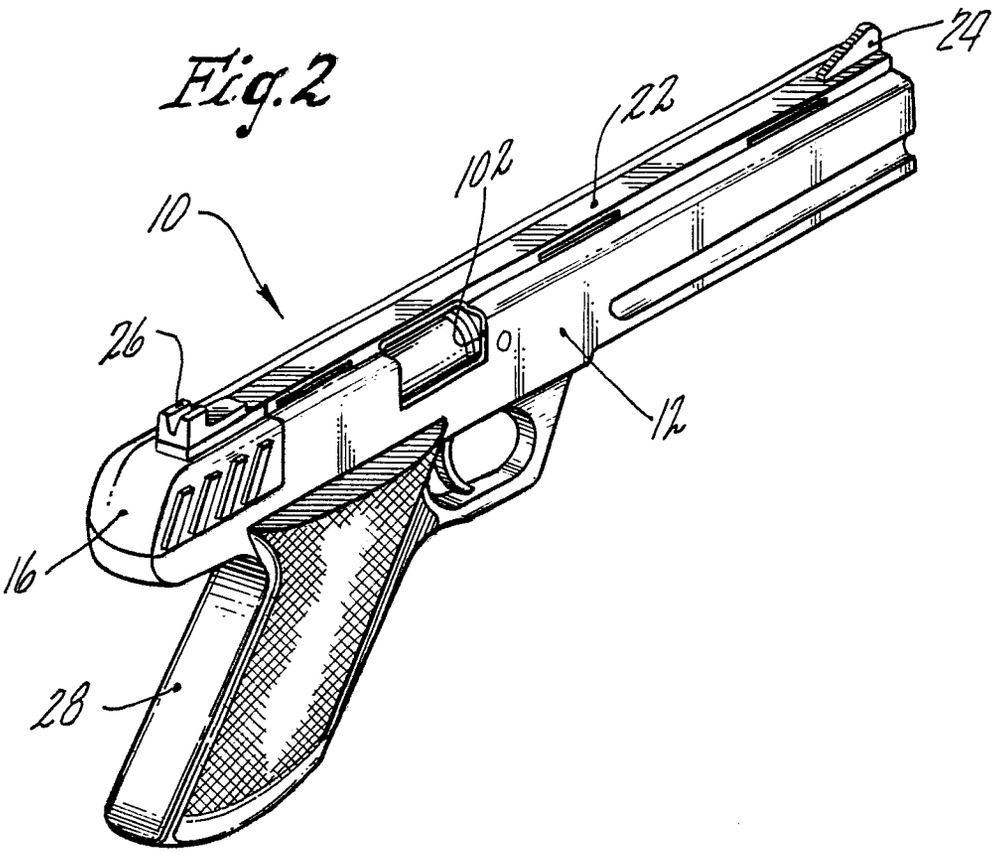


Fig.2



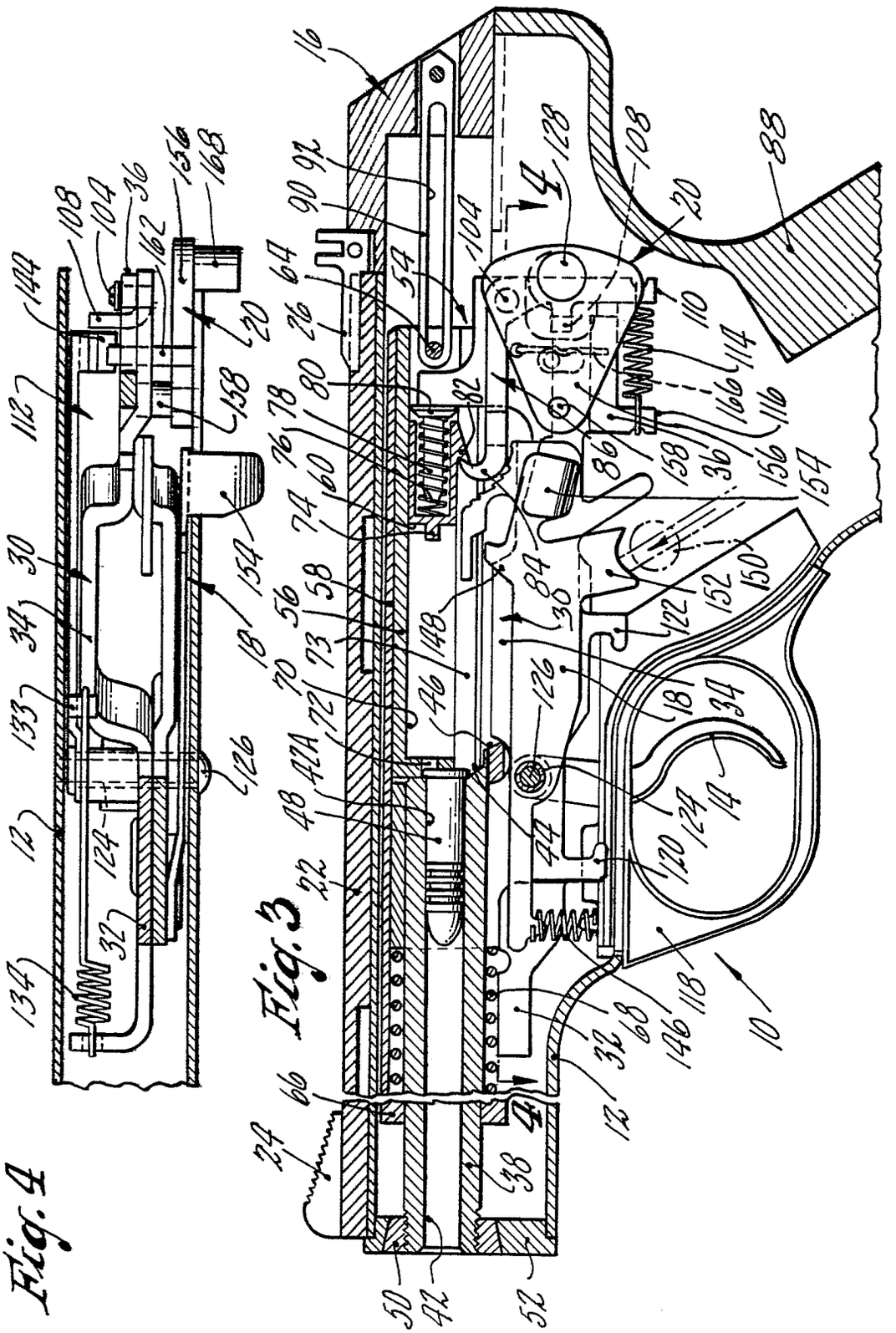


Fig. 3

Fig. 4

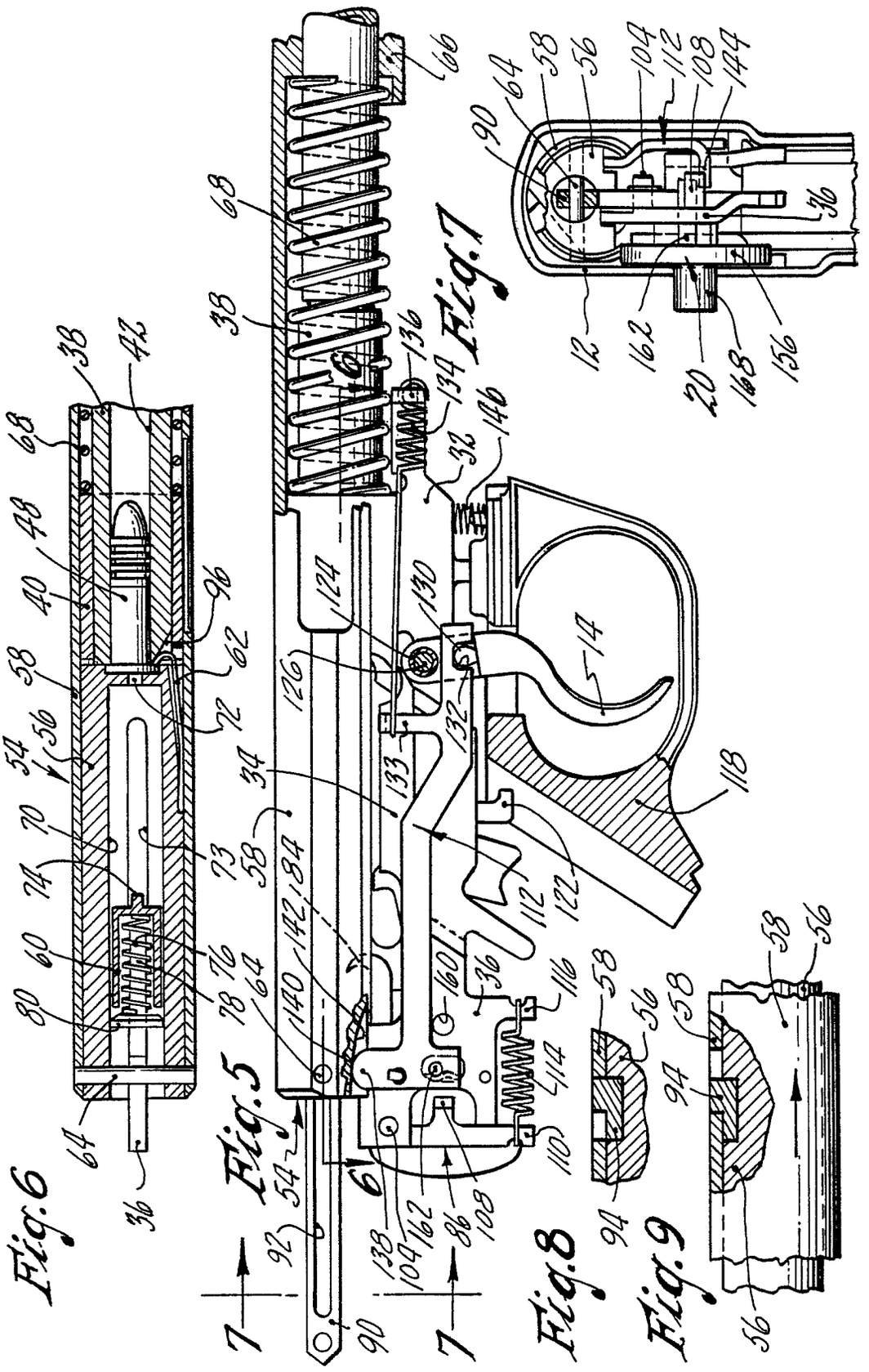


Fig.6
Fig.5
Fig.7
Fig.8
Fig.9

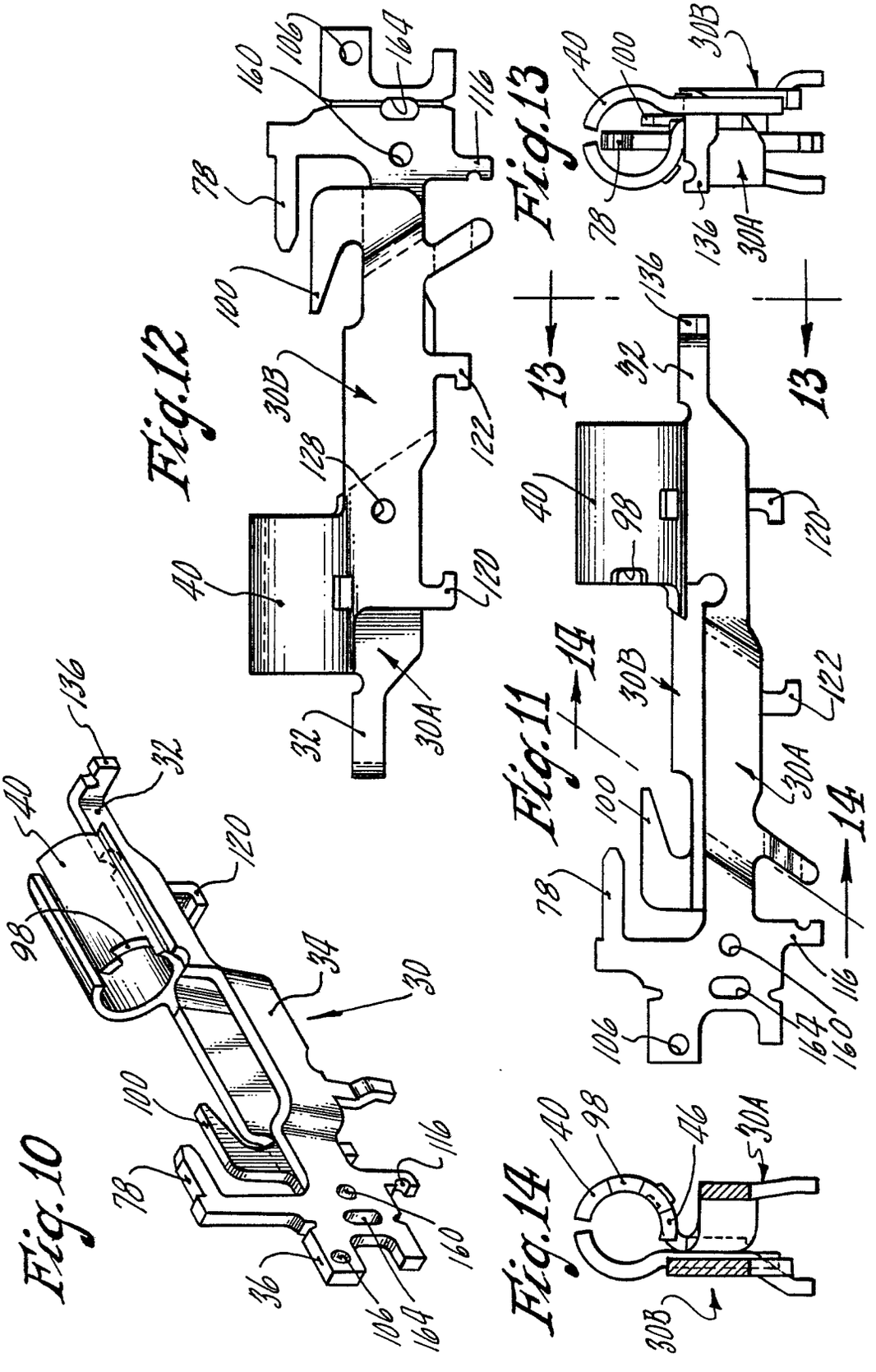


Fig. 10
Fig. 11
Fig. 12
Fig. 13
Fig. 14
13
14
30A
30B
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