CLAIMS

Claims:

1. A firearm comprising:

a bolt carrier;

a backbone configured to guide the bolt carrier;

a lower receiver within which the bolt carrier is at least partially disposed, wherein the backbone is removably attached to the lower receiver;

a barrel latch attached to the backbone;

a barrel configured to disengage from the backbone when the barrel latch is pushed;

a trigger block assembly configured to drop into the lower receiver;

a gas piston having a plurality of piston rings configured to only rotate substantially in unison with one another, wherein the gas piston is configured to move the bolt carrier when a cartridge is discharged;

a metered gas port disposed out of the barrel for metering gas from the barrel to the gas piston;

a spring guide having a main spring disposed thereon for biasing the bolt carrier in a forward position;

an anti-bounce weight at least partially contained within the spring guide;

a bolt carried by the bolt carrier;

an extractor attached to the bolt;

two springs disposed within the bolt for biasing the extractor toward a closed position of the extractor;

a bar inhibiting separation of the lower receiver and the backbone when the main spring is compressed;

a firing pin disposed within the bolt;

one of:

a firing pin retaining pin configured to facilitate removal of the firing pin and configured to transfer forward movement of the bolt carrier to the firing pin to cause a cartridge to fire;

a hammer assembly disposed within the lower receiver and having a hammer and a link with one end of the link attached to the hammer and another end of the link attached to the lower receiver such that the hammer has a rearward position that is below the bolt when the bolt is in a rearward position and the hammer has a forward position where the hammer strikes the firing pin when the bolt is in a forward position and wherein the link is configured such that the hammer has sufficient throw to travel over a last round stop as the hammer moves from the rearward position to the forward position wherein the link, not the hammer, has notches actuated by a trigger motion;

a takedown lever configured to inhibit separation of the backbone and the lower receiver, the takedown lever having a safety lock pin to inhibit inadvertent movement of the takedown lever;

a charging handle configured to move rearward to move the bolt carrier from a closed bolt position to an open bolt position;

a dust cover configured to open partially to allow the charging handle to move rearward and to block bolt release from open bolt position until the cocking handle has returned forward;

a gas port flash suppressor configured to guide the barrel during mating of the barrel to the backbone; and

a stock having a handle formed therein, wherein a projection is configured to inhibit vertical movement of a stock.

2. A firearm comprising:

a bolt carrier;

a backbone configured to guide the bolt carrier;

a lower receiver within which the bolt carrier is at least partially disposed, wherein the backbone is removably attached to the lower receiver;

a barrel latch attached to the backbone;

a barrel configured to disengage from the backbone when the barrel latch is pushed; and

a trigger block assembly configured to drop into the lower receiver.

3. A device comprising:

a bolt carrier for a firearm;

a backbone configured to at least partially guide the bolt carrier as the bolt carrier moves forward and backward during a firing cycle of the firearm; and

wherein the bolt carrier is not completely contained within the backbone.

4. The device as recited in Claim 3, wherein a portion of the bolt carrier is contained within the backbone and a portion of the bolt carrier is not contained within the backbone.

5. The device as recited in Claim 3, wherein part of the bolt carrier hangs below the backbone.

6. The device as recited in Claim 3, wherein part of the bolt carrier is slidably disposed within the backbone.

7. The device as recited in Claim 3, wherein:

the backbone is generally tubular and has a slot formed longitudinally therein;

the bolt carrier has an upper portion contained within the backbone, a lower portion not contained within the backbone, and a waist interconnecting the upper portion and the lower portion; and

wherein the waist is disposed within the slot and the upper portion moves longitudinally within the backbone.

8. The device as recited in Claim 3, further comprising:

a bolt having a cam pin extending therefrom;

wherein:

the bolt carrier comprises a cam for rotating the bolt by camming the cam pin;

the backbone comprises a cutout extending from one side of the slot; and

a portion of the cam pin extends into the slot to inhibit rotation of the bolt when the bolt carrier is in a rearward position, the portion of the cam pin moves from the slot into the cutout to facilitate camming of the cam pin and rotation of the bolt when the bolt is in a forward position, and the cam pin moves from the cutout into the slot when the bolt carrier moves rearward.

9. The device as recited in Claim 3, wherein the device is a firearm.

10. A firearm comprising:

a backbone disposed within a receiver;

a bolt carrier; and

wherein movement of the bolt carrier is constrained by the backbone and is not constrained by the receiver.

11. A method comprising:

placing a portion of a bolt carrier within a backbone while leaving another portion of the bolt carrier out of the backbone; and

wherein the backbone is configured to at least partially guide the bolt carrier as the bolt carrier moves forward and backward during a firing cycle of a firearm.

12. A method comprising:

at least partially guiding a bolt carrier with a backbone as the bolt carrier moves forward and backward during a firing cycle of a firearm; and

wherein the bolt is not contained within the backbone.

13. A device comprising:

a bolt carrier for a firearm, the bolt carrier having a generally tubular upper portion, a generally rectangular lower portion, and a waist interconnecting the upper portion and the lower portion; and

wherein the upper portion is substantially longer than the lower portion.

14. The device as recited in Claim 13, wherein a front of the upper portion is forward of the lower portion.

15. The device as recited in Claim 13, wherein the bolt carrier has four surfaces for contacting a backbone that are forward on the bolt carrier and has four surface for contacting the backbone that are aft on the bolt carrier.

16. The device as recited in Claim 13, wherein device comprises a firearm.

17. A method comprising:

forming a bolt carrier for a firearm to have a generally tubular upper portion, a generally rectangular lower portion, and a waist interconnecting the upper portion and the lower portion; and

wherein the upper portion is substantially longer than the lower portion.

18. A method comprising:

chambering a cartridge in a firearm using a bolt carrier having a generally tubular upper portion, a generally rectangular lower portion, and a waist interconnecting the upper portion and the lower portion; and

wherein the upper portion is substantially longer than the lower portion.

19. A firearm comprising:

a backbone;

a barrel removably attached to the backbone;

a barrel latch attached to the backbone;

a swinging wedge defining part of the barrel latch;

a pin attached to the barrel; and

wherein the swinging wedge is configured to facilitate attachment of the barrel to the backbone via the pin such that moving the barrel latch allows the barrel to detach from the backbone.

20. The firearm as recited in Claim 19, wherein the swinging wedge is configured such that approximately the same force is applied to the barrel regardless of where along the swinging wedge the pin contacts the swinging wedge.

21. The firearm as recited in Claim 19, wherein the swinging wedge is curved.

22. The firearm as recited in Claim 19, wherein the swinging wedge is curved and a pivot of the swinging wedge is not concentric with a radius of the swinging wedge.

23. The firearm as recited in Claim 19, wherein the swinging wedge is curved and a pivot of the swinging wedge is offset with respect to a radius of the swinging wedge by an angle of approximately 8°.

24. The firearm as recited in Claim 19, further comprising:

a tensioner for providing a preload of the pin with respect to the swinging wedge; and

wherein the tensioner accommodates radial thermal expansion of the barrel.

25. The firearm as recited in Claim 19, further comprising a tensioner for providing a preload of approximately 700 lbs. for the pin with respect to the swinging wedge.

26. The firearm as recited in Claim 19, further comprising:

two V-blocks attached to the backbone into which the barrel is pulled by the swinging wedge; and

wherein the V-blocks maintain alignment of the barrel with respect to the backbone while the a tensioner accommodates thermal expansion of the barrel.

27. The firearm as recited in Claim 19, further comprising:

a first guide cam configured to move the barrel forward beyond a front of the lower receiver to release the barrel from the backbone when a proximal end of the barrel latch is moved; and

a second guide configured to swing the barrel forward of a magazine of the firearm so the barrel can drop away from the firearm without contacting the magazine.

28. The firearm as recited in Claim 19, wherein the swinging wedge is defined by

wedge surfaces formed in paws that are moved by a lever end of the barrel latch.

29. A method comprising:

attaching a barrel latch to a backbone of a firearm, the backbone having a swinging wedge attached thereto;

attaching a barrel to the backbone via a pin attached to the barrel that is captured by the swinging wedge; and

wherein the swinging wedge is configured to facilitate detachment of the barrel from the backbone by moving the barrel latch.

30. A method comprising:

moving a swinging wedge of a firearm; and

wherein moving the swinging wedge facilitates detachment of a barrel from a backbone of the firearm.

31. A device comprising:

a trigger block assembly for a firearm; and

wherein the trigger block assembly is configured to drop into the firearm.

32. The device as recited in Claim 31, wherein the device is a firearm.

33. A method comprising:

assembling a trigger block assembly for a firearm;

providing a lower receiver for the firearm; and

assembling the trigger block assembly to the lower receiver by dropping the trigger block assembly into the lower receiver.

34. A method comprising:

firing a firearm by pulling a trigger of the firearm;

wherein the trigger is part of a trigger block assembly; and

wherein the trigger block assembly is configured to drop into a receiver of the firearm during assembly of the firearm.

35. A device comprising:

a piston for a gas operated firearm; and

two protrusions formed upon the piston and configured to limit rearward movement of the piston when the firearm is discharged.

36. The device as recited in Claim 35, further comprising:

a cylinder in which the piston is slidably disposed;

two slots formed in the cylinder receiving the two protrusions; and

wherein the two slots define gas vents from which gas escapes after the firearm is discharged.

37. The device as recited in Claim 35, wherein the piston is not attached to the bolt carrier.

38. The device as recited in Claim 35, further comprising:

a plurality of rings disposed about the piston; and

wherein the rings are configured to only rotate substantially in unison with one another

39. The device as recited in Claim 35, wherein the device comprises a firearm.

40. A method comprising:

placing a piston into a cylinder of a gas operated firearm; and

wherein the piston has two protrusions formed thereon and the protrusions are slidably disposed in two slots formed in the cylinder such that the protrusions limit movement of the piston.

41. A method comprising:

firing a gas operated firearm to provide gas to a piston of the firearm;

wherein the piston moves in response to pressure provided by the gas; and

wherein movement of the piston is limited by two protrusions formed upon the piston.

42. A device comprising:

a recoil spring configured to be compressed by rearward movement of a bolt carrier when a firearm is discharged;

a spring guide for limiting movement of the recoil spring;

an anti-bounce weight defined by at least a portion of the spring guide; and

wherein the anti-bounce weight is configured to inhibit bouncing of a bolt carrier of the firearm.

43. The device as recited in Claim 42, wherein:

the spring guide comprises a rod and a sleeve surrounding a portion of the rod; and

timing for the anti-bounce weight is at least partially determined by a distance between the front end of the anti-bounce weight and the inside of the front cap of the bolt carrier.

44. The device as recited in claim 42, where the device is a firearm.

45. A method comprising:

assembling a spring guide for a firearm;

defining an anti-bounce weight with at least a portion of the spring guide; and

wherein the anti-bounce weight is configured to inhibit bouncing of a bolt carrier of the firearm.

46. A method comprising:

firing a firearm;

guiding a recoil spring of the firearm with a spring guide; and

inhibiting bouncing of a bolt carrier of the firearm with an anti-bounce weight defined by at least a portion of the spring guide.

47. A device comprising:

a lower receiver for a firearm;

a bolt having a forward position and a reward position;

a firing pin disposed substantially within the bolt;

a hammer assembly disposed within the lower receiver and having a hollow tubular hammer and a link; and

wherein one end of the link is pivotally attached to the hammer and another end of the link is pivotally attached to the lower receiver such that the hammer has a rearward position that is below the bolt when the bolt is in the rearward position and the hammer has a forward position where the hammer strikes the firing pin when the bolt is in a forward position and the link is configured such that the hammer has sufficient throw to travel over a last round stop as the hammer moves from the rearward position to the forward position and wherein the link, not the hammer, has sear notches held and released by the trigger motion.

48. The device as recited in Claim 47, further comprising:

a spring guide pivotally attached to the lower receiver and received within a bore of hammer;

a spring disposed upon the spring guide; and

wherein the spring biases the hammer toward the forward position.

49. The device as recited in Claim 47, wherein the device is a firearm.

50. A method comprising:

installing a hammer assembly within a lower receiver of a firearm, the hammer assembly having a hammer and a link; and

wherein one end of the link is pivotally attached to the hammer and another end of the link is pivotally attached to a lower receiver such that the hammer has a rearward position that is below a bolt when the bolt is in a rearward position and the hammer has a forward position where the hammer strikes a firing pin when the bolt is in a forward position and the link is configured such that the hammer has sufficient throw to travel over a last round stop as the hammer moves from the rearward position to the forward position.

51. A method comprising:

pulling a trigger to discharge a firearm;

striking a firing pin with a hammer in response to pulling the trigger; and

wherein one end of a link is pivotally attached to the hammer and another end of the link is pivotally attached to a lower receiver such that the hammer has a rearward position that is below a bolt when the bolt is in the rearward position and the hammer has a forward position where the hammer strikes the firing pin when the bolt is in a forward position and the link is configured such that the hammer has sufficient throw to travel over a last round stop as the hammer moves from the rearward position to the forward position.

52. A device comprising:

a stock for a firearm;

a butt formed on a distal end of the stock; and

a handle formed in the butt and configured to inhibit vertical movement of the stock when a hand is grasping the stock.

53. The device as recited in claim 52, wherein the device is a firearm.

54. A method comprising:

forming a generally horizontal handle in a butt at the distal end of a stock for a firearm; and

wherein the generally horizontal handle is configured to inhibit vertical movement of the stock when a hand is grasping the butt.

55. A method comprising:

discharging a firearm; and

grasping a butt of a stock of the firearm with a hand while the firearm is being discharged; and

wherein a generally horizontal handle formed in the butt inhibits vertical movement of the stock.

56. A gas operated firearm comprising:

a barrel;

a barrel gas port formed in the barrel;

a gas system;

a metered gas port not disposed in the barrel and configured to metered gas from the barrel to the gas system; and

wherein the metered gas port tends to maintain a substantially uniform quantity of gas to the gas system as the barrel gas port enlarges due to wear.

57. The firearm as recited in Claim 56, wherein the metered gas port comprises an adjustment screw for varying the quantity of gas to the gas system.

58. The firearm as recited in Claim 56, wherein the metered gas port comprises:

a first tubular member;

a second tubular member interlocking with the first tubular member; and

wherein gas flows through the first tubular member and the second tubular member.

59. The firearm as recited in Claim 56, further comprising:

a gas block;

wherein the metered gas port comprises:

a first tubular member;

a second tubular member interlocking with the first tubular member; and

wherein the first tubular member is inserted into the gas block of the firearm and the second tubular member is subsequently inserted into the gas block and into the first tubular member.

60. The firearm as recited in Claim 56, further comprising:

a gas block;

wherein the metered gas port comprises:

a first tubular member;

a second tubular member interlocking with the first tubular member;

wherein the first tubular member is inserted into the gas block of the firearm and the second tubular member is subsequently inserted into the gas block and into the first tubular member; and

a screw that screws into the first tubular member to lock the first tubular member to the second tubular member and to lock the first tubular member and the second tubular member into the gas block.

61. A method comprising:

forming a barrel gas port in a barrel of a firearm;

attaching a metered gas port to the firearm at a location not in the barrel;

wherein the metered gas port is configured to meter gas from the barrel to a gas system; and

wherein the metered gas port tends to maintain a substantially uniform quantity of gas to the gas system as the barrel gas port enlarges due to wear.

62. A method comprising:

metering gas to the gas system of a firearm using a metered gas port;

wherein the metered gas port is not disposed in a barrel of the firearm; and

wherein the metered gas port tends to maintain a substantially uniform quantity of gas from the barrel to the gas system as the barrel gas port enlarges due to wear.

63. A device comprising:

an extractor for a firearm, wherein the extractor has a closed position and an open position;

two springs for biasing the extractor toward the closed position; and

wherein the extractor is sufficiently wide to be biased by the two springs.

64. The device as recited in Claim 63, further comprising:

a bolt for a firearm, the bolt comprising:

a body;

a firing pin hole formed in the body;

a firing pin disposed in the firing pin hole; and

two spring holes formed in the body approximately parallel with respect to the firing pin hole, wherein each spring hole contains one of the two springs.

65. The device as recited in Claim 64, wherein the two spring holes are within approximately 5° of being parallel with respect to the firing pin hole.

66. The device as recited in Claim 64, wherein the two spring holes are proximate one another and are parallel with respect to one another.

67. The device as recited in Claim 64, further comprising:

an extractor stop pin hole formed in the body; and

an extractor stop pin disposed in the extractor stop pin hole such that the extractor stop pin limits rearward movement the extractor with respect to the body.

68. The device as recited in Claim 64, further comprising:

a pivot bump formed upon the extractor;

a retaining groove within which the pivot bump is at least partially disposed;

an extractor stop pin hole formed in the body; and

an extractor stop pin disposed in the extractor stop pin hole such that the extractor stop pin prevents the extractor from moving rearward enough for the pivot bump to move out of the retaining groove.

69. The device as recited in Claim 64, further comprising:

an extractor cavity formed in the body and configured to contain at least a portion of the extractor; and

wherein the extractor cavity is open on one side thereof and is closed on another side thereof.

70. The device as recited in Claim 63, wherein the device is a firearm.

71. A method comprising:

inserting two springs into a bolt for a firearm;

attaching an extractor to the bolt; and

wherein the two springs bias the extractor toward a closed position of the extractor.

72. A method comprising:

discharging a firearm;

biasing an extractor of the firearm toward a closed position of the extractor with two springs; and

extracting a cartridge case from a chamber of the firearm with the extractor.

73. A device comprising:

a recoil spring for a firearm;

a bolt carrier having a forward position and a rearward position, wherein the recoil spring biases the bolt carrier in the forward position;

a bar configured to be pulled forward by the bolt carrier as the bolt carrier chambers a cartridge; and

wherein the bar is configured to inhibit takedown of the firearm when the bolt carrier is in the rearward position thereof and the recoil spring is compressed.

74. The device as recited in claim 73, wherein the bar releases a hammer of the firearm when the bolt of the firearm is substantially fully forward.

75. The device as recited in claim 73, wherein the bar releases a hammer of the firearm to strike a firing pin when the bolt of the firearm is locked.

76. The device as recited in Claim 73, wherein the device is a firearm.

77. A method comprising:

installing a recoil spring in a firearm;

installing a bolt carrier in the firearm such that the recoil spring biases the bolt carrier in a forward position of the bolt carrier;

installing a bar in the firearm, the bar being configured to be pulled forward by the bolt carrier as the bolt carrier chambers a cartridge; and

wherein the bar is configured to inhibit takedown of the firearm when the bolt carrier is in a rearward position thereof and the recoil spring is compressed.

78. A method comprising:

biasing a bolt carrier in a forward position with a recoil spring;

discharging the firearm to move the bolt carrier to a rearward position and then back to a forward position;

pulling a bar forward by the bolt carrier as the bolt carrier chambers a cartridge; and

wherein the bar is configured to inhibit takedown of the firearm when the bolt carrier is in the rearward position thereof and the recoil spring is compressed.

79. A device comprising:

a backbone for a firearm;

a lower receiver for the firearm;

a takedown lever having a first position and a second position, wherein when the takedown lever is in the first position separation of the backbone from the lower receiver is facilitated and when the takedown lever is in the second position separation of the backbone from the lower receiver is inhibited; and

a safety lock pin inhibiting inadvertent movement of the takedown lever from the first position to the second position and inhibiting inadvertent movement of the takedown lever from the second position to the first position.

80. The device as recited in Claim 79, wherein the device is a firearm.

81. A method comprising:

assembling a takedown lever to a firearm, the takedown lever having a first position and a second position, wherein when the takedown lever is in the first position separation of the backbone from the lower receiver is facilitated and when the takedown lever is in the second position separation of the backbone from the lower receiver is inhibited; and

assembling a safety lock pin to the firearm, the safety lock pin inhibiting inadvertent movement of the takedown lever from the first position to the second position and inhibiting inadvertent movement of the takedown lever from the second position to the first position.

82. A method comprising:

moving a safety lock pin of a firearm to facilitate movement of a takedown lever of the firearm;

moving the takedown lever from a first position thereof to a second position thereof to facilitate disassembly of the firearm; and

wherein the safety lock pin inhibits inadvertent movement of the takedown lever from the first position to the second position and inhibits inadvertent movement of the takedown lever from the second position to the first position.

83. A device comprising:

a charging handle for a firearm; and

a dust cover configured to open approximately 7° to allow the charging handle to move rearwards as the firearm is cocked.

84. The device as recited in Claim 83, wherein the device is a firearm.

85. A method comprising:

assembling a charging handle to a firearm;

assembling a dust cover to the firearm; and

wherein the dust cover configured to open approximately 7° to allow the charging handle to move rearwards as the firearm is cocked.

86. A method comprising:

moving a charging handle of a firearm rearward to cock the firearm; and

opening, by the charging arm, a dust cover approximately 7° to allow the charging handle to move rearwards as the firearm is cocked.

87. A device comprising:

a firing pin;

a firing pin retaining pin configured to retain the firing pin in a bolt of a firearm; and

wherein the firing pin retaining pin is configured to transfer forward movement of a bolt carrier to the firing pin to cause the firearm to discharge.

88. The device as recited in Claim 87, wherein the device is a firearm.

89. A method comprising:

assembling a firing pin into a bolt of a firearm;

retaining the firing pin within the bolt with a firing pin retaining pin; and

wherein the firing pin retaining pin is configured to transfer forward movement of a bolt carrier to the firing pin to cause the firearm to discharge.

90. A method comprising:

pulling a trigger of a firearm;

moving a bolt carrier forward in response to the trigger being pulled; and

transferring forward movement of the bolt carrier to a firing pin via a firing pin retaining pin that is configured to retain the firing pin within a bolt.

91. A device comprising:

a cylinder disposed in a backbone of a gas operated firearm;

a gas exhaust port formed in the cylinder for exhausting gas from the cylinder; and

a gas exhaust port flash suppressor configured to guide a barrel to the backbone to facilitate attachment of the barrel to the backbone.

92. The device as recited in Claim 91, wherein the device is a firearm.

93. A method comprising:

assembling a cylinder into a backbone of a gas operated firearm, wherein the cylinder has a gas exhaust port for exhausting gas from the cylinder;

attaching a gas exhaust port flash suppressor to the backbone; and

wherein the gas exhaust port flash suppressor is configured to guide a barrel to the backbone to facilitate attachment of the barrel to the backbone.

94. A method comprising:

exhausting gas from a gas exhaust port of a cylinder of a gas operated firearm; and

suppressing flash from the gas exhaust port with a flash suppressor configured to guide a barrel to the backbone to facilitate attachment of the barrel to the backbone.

95. A device comprising:

a semi-automatic firearm configured for both closed bolt operation and open bolt operation; and

wherein the firearm comprises a selector mechanism configured to select between closed bolt operation and open bolt operation of the firearm.

96. A device comprising:

a firearm having a bolt and configured for both closed bolt operation and open bolt operation;

wherein the firearm comprises a trigger mechanism configured such that:

during open bolt operation when the bolt is rearward, pulling the trigger only allows the bolt to move forward when a cocking handle is forward; and

only in closed bolt operation can the bolt be manually eased forward using the cocking handle.

97. A firearm comprising:

a barrel;

a backbone;

a lower receiver;

two V-blocks and a swinging wedge at least partially attaching the barrel to the firearm;

wherein the V-blocks are configured such that:

when the barrel expands longitudinally, the barrel slides in the V-blocks;

when the barrel expands radially, the barrel does not push the swinging wedge backwards against spring tension; and

when barrel expands radially, a tensioner accommodates expansion.

98. A firearm comprising:

a lower receiver;

a backbone;

wherein the lower receiver is attached to the backbone via two hook pivots;

wherein the lower receiver can pivot downward approximately 40° from two backbone studs attached to the backbone; and

wherein the lower receiver can be detached from the backbone when pivoted down approximately 20° or halfway where a gap in the hook pivot allows the lower receiver to be lifted up and off the backbone studs.

99. A firearm comprising:

a barrel having a barrel extension with a flange;

a forward v-block;

an rearward v-block having a groove;

a tensioner;

wherein the tensioner urges the barrel into the forward v-block and the rearward v-block and the groove receives the flange; and

wherein the flange and the groove cooperated to position a centerline of the barrel and the forward v-block and the rearward v-block cooperate to accommodate radial and longitudinal thermal expansion of the barrel.

100. A firearm comprising:

a backbone;

a barrel;

a swinging wedge attached to the backbone;

a tensioner;

a pin attached to the tensioner;

wherein the swinging wedge removably attaches the barrel to the backbone; and

wherein the tensioner applies a preload between the barrel and the backbone by deforming a plurality of spring washers when the swinging wedge attaches the barrel to the backbone.

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1. A firearm comprising:

a backbone disposed within a receiver and having a slot formed therein;

a barrel having a barrel extension; and

a swinging wedge configured to engage a cross pin on the barrel to pull the barrel upward into a plurality of v-blocks on the backbone and to pull a flange on the barrel extension upward into a groove in the backbone to center the barrel and lock the barrel extension from fore and aft motion in relation to the backbone.

2. The firearm as recited in Claim 1, wherein the backbone is configured to at least partially guide a bolt carrier as the bolt carrier moves forward and backward during a firing cycle of a firearm.

3. The firearm as recited in Claim 1 wherein:

the backbone at least partially guides bolt carrier as the bolt carrier moves forward and backward during a firing cycle of a firearm; and

the bolt is not contained within the backbone.

4. The firearm as recited in Claim 1, further comprising a bolt carrier that has a generally tubular upper portion and a generally rectangular lower portion; and

wherein the upper portion is substantially longer than the lower portion.

5. The firearm as recited in Claim 1, further comprising a bolt carrier having an upper portion and a lower portion, wherein a front of the upper portion is forward of the lower portion.

6. The firearm as recited in Claim 1, further comprising a bolt carrier, wherein the bolt carrier has four surfaces for contacting the backbone that are forward on the bolt carrier and has four surfaces for contacting the backbone that are aft on the bolt carrier.

7. The firearm as recited in Claim 1, further comprising:

a bolt carrier;

wherein the backbone is configured to guide the bolt carrier;

wherein the receiver comprises a lower receiver within which the bolt carrier is at least partially disposed;

wherein the backbone is removably attached to the lower receiver; and

a trigger block assembly configured to drop into the lower receiver.

8. The firearm as recited in Claim 7, wherein the backbone is configured to at least partially guide the bolt carrier as the bolt carrier moves forward and backward during a firing cycle of the firearm.

9. The firearm as recited in Claim 7, wherein a portion of the bolt carrier is contained within the backbone and a portion of the bolt carrier is not contained within the backbone.

10. The firearm as recited in Claim 7, wherein part of the bolt carrier hangs below the backbone.

11. The firearm as recited in Claim 7, wherein part of the bolt carrier is slidably disposed within the backbone.

12. The firearm as recited in Claim 7, wherein:

the backbone is generally tubular and has a slot formed longitudinally therein;

the bolt carrier has an upper portion contained within the backbone, a lower portion not contained within the backbone, and a waist interconnecting the upper portion and the lower portion; and

the waist is disposed within the slot and the upper portion moves longitudinally within the backbone.

13. The firearm as recited in Claim 7, further comprising:

a bolt having a cam pin extending therefrom;

wherein:

the bolt carrier comprises a cam for rotating the bolt by camming the cam pin;

the backbone comprises a cutout extending from one side of the slot; and

a portion of the cam pin extends into the slot to inhibit rotation of the bolt when the bolt carrier is in a rearward position, the portion of the cam pin moves from the slot into the cutout to facilitate camming of the cam pin and rotation of the bolt when the bolt is in a forward position, and the cam pin moves from the cutout into the slot when the bolt carrier moves rearward.

14. The firearm as recited in Claim 7, wherein:

the bolt carrier has a generally tubular upper portion, a generally rectangular lower portion, and a waist interconnecting the upper portion and the lower portion; and

the upper portion is substantially longer than the lower portion.

15. The firearm as recited in Claim 7, wherein the firearm comprises a firing pin and a hammer assembly.

16. The firearm as recited in Claim 7, further comprising:

a gas piston having a plurality of piston rings configured to only rotate substantially in unison with one another, wherein the gas piston is configured to move the bolt carrier when a cartridge is discharged;

a metered gas port disposed out of the barrel for metering gas from the barrel to the gas piston;

a spring guide having a main spring disposed thereon for biasing the bolt carrier in a forward position;

an anti-bounce weight at least partially contained within the spring guide;

a bolt carried by the bolt carrier;

an extractor attached to the bolt;

two springs disposed within the bolt for biasing the extractor toward a closed position of the extractor;

a bar inhibiting separation of the lower receiver and the backbone when the main spring is compressed;

a firing pin disposed within the bolt;

a takedown lever configured to inhibit separation of the backbone and the lower receiver, the takedown lever having a safety lock pin to inhibit inadvertent movement of the takedown lever;

a charging handle configured to move rearward to move the bolt carrier from a closed bolt position to an open bolt position;

a dust cover configured to open partially to allow the charging handle to move rearward and to block bolt release from open bolt position until the cocking handle has returned forward;

a gas port flash suppressor configured to guide the barrel during mating of the barrel to the backbone; and

a stock having a handle formed therein, wherein a projection is configured to inhibit vertical movement of a stock; and

at least one of:

a firing pin retaining pin configured to facilitate removal of the firing pin and configured to transfer forward movement of the bolt carrier to the firing pin to cause a cartridge to fire; and/or

a hammer assembly disposed within the lower receiver and having a hammer and a link with one end of the link attached to the hammer and another end of the link attached to the lower receiver such that the hammer has a rearward position that is below the bolt when the bolt is in a rearward position and the hammer has a forward position where the hammer strikes the firing pin when the bolt is in a forward position and wherein the link is configured such that the hammer has sufficient throw to travel over a last round stop as the hammer moves from the rearward position to the forward position wherein the link, not the hammer, has notches actuated by a trigger motion.

17. The firearm of any of Claims 1, 7, or 16 wherein the cross pin passes through both sides of an open top of a U-shaped yoke with a closed bottom that passes under the barrel and supports a compressed spring configured to push upward on the barrel while pulling the cross pin

downward tight against the barrel to allow the barrel to expand due to heat generated by fully automatic sustained fire to allow an expanding diameter of the barrel in the v-blocks to move downward to further compress the spring without disturbing a position or a hold of the swinging wedge on the cross pin.

18. The firearm as recited in any of the preceding claims, wherein the firearm is a fully automatic firearm.