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Burns et al.

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(54) **MAGAZINE RELEASE BUTTON INTERFERENCE PIN ASSEMBLY AND AR-STYLE LOWER RECEIVER**

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Related U.S. Application Data

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(51) **Int. Cl.**

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F41A 17/38	(2006.01)
F41A 3/66	(2006.01)
F41A 9/59	(2006.01)

(52) **U.S. Cl.**

CPC ***F41A 9/63*** (2013.01); ***F41A 3/66*** (2013.01); ***F41A 9/59*** (2013.01); ***F41A 17/38*** (2013.01)

(58) **Field of Classification Search**

CPC F41A 9/63; F41A 9/64; F41A 9/59; F41C 7/11

See application file for complete search history.

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(57) **ABSTRACT**

Magazine release button interference pin assembly and AR-style lower receiver functions to prevent the depression of the magazine release button on an AR-style rifle while the upper receiver is closed or locked onto the lower receiver. Magazine release button interference pin assembly and AR-style lower receiver prevents magazine release and reloading while the upper receiver is closed or locked onto the lower receiver. Magazine release button interference pin assembly and AR-style lower receiver is a magazine release button interference pin assembly as well as a specially machined lower receiver to accept the magazine release button interference pin assembly. Magazine release button interference pin assembly includes a special magazine release button interference pin with at least two protrusions, a spring, and a retaining pin.

1 Claim, 8 Drawing Sheets

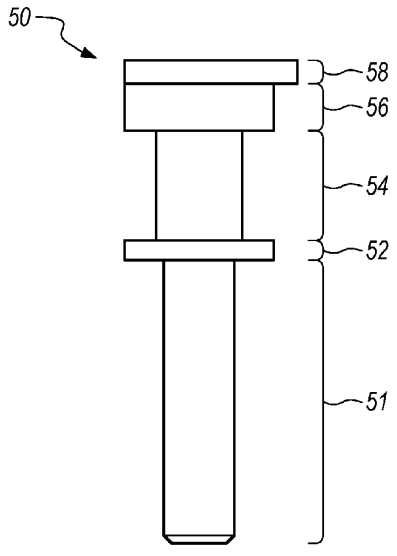


FIG. 1

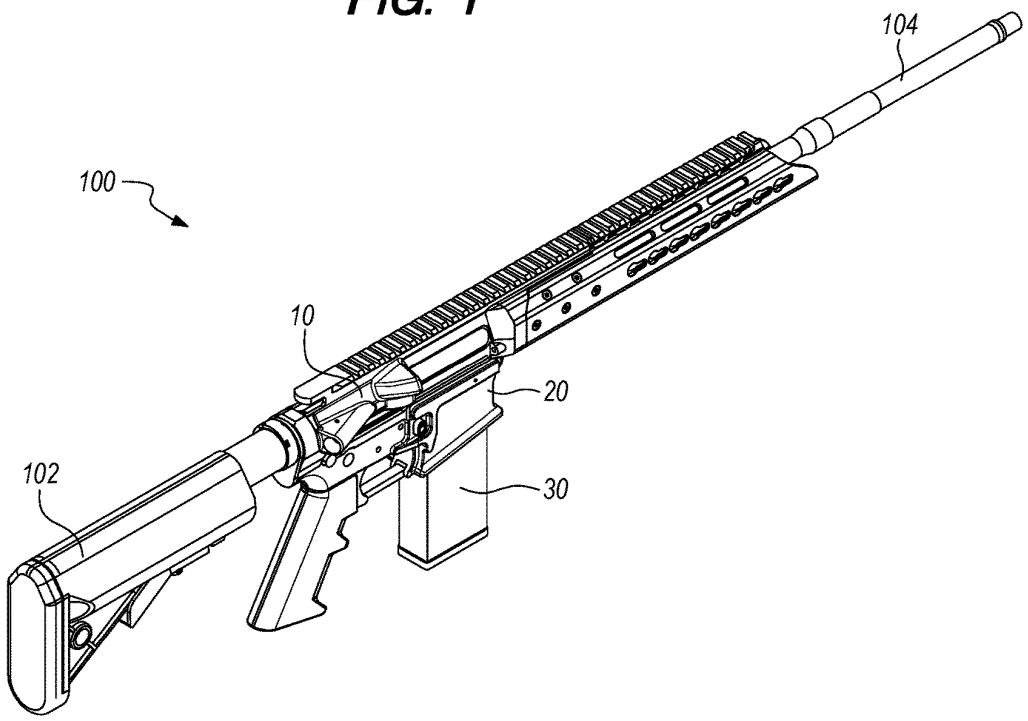


FIG. 2

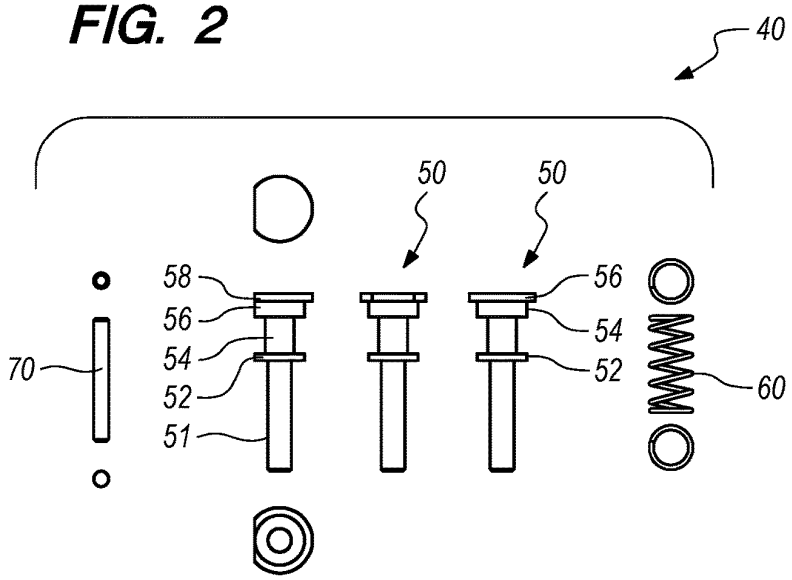


FIG. 3

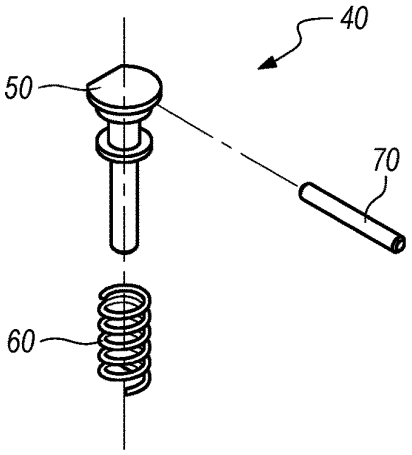


FIG. 4

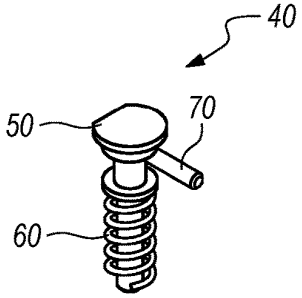


FIG. 5

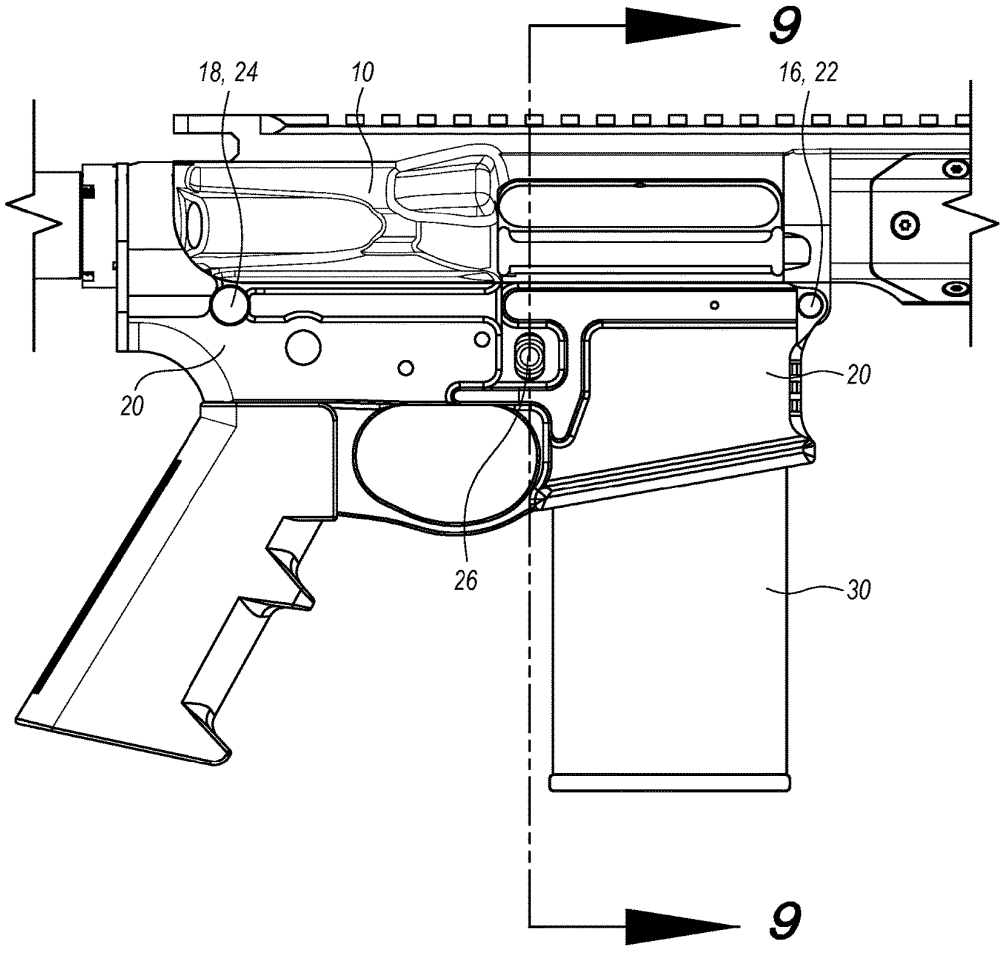


FIG. 6

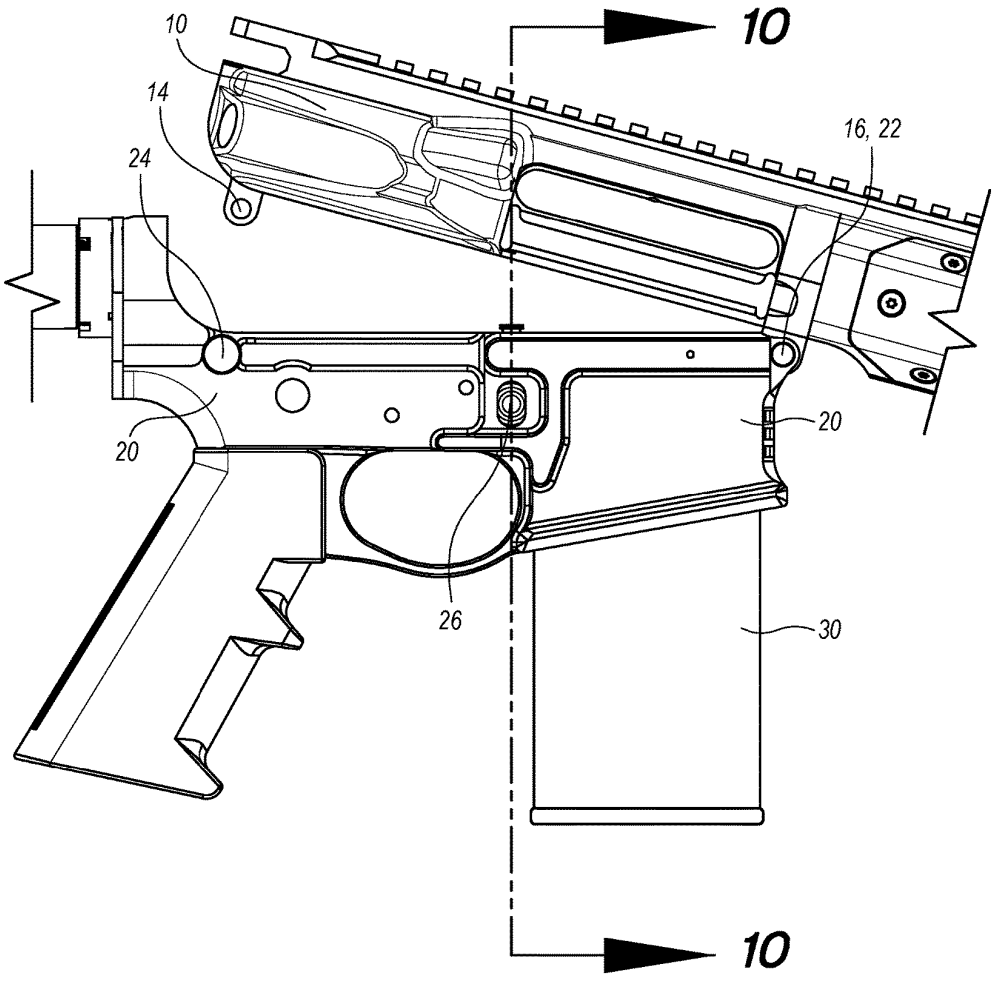


FIG. 7

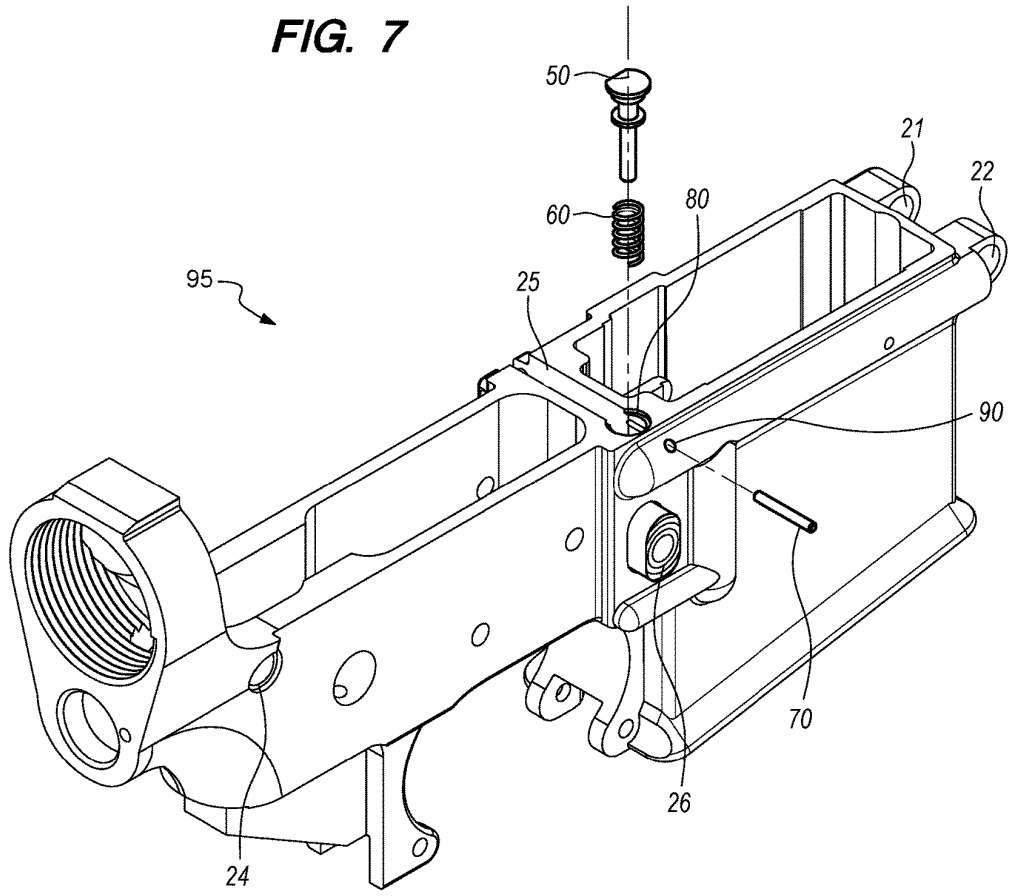


FIG. 8

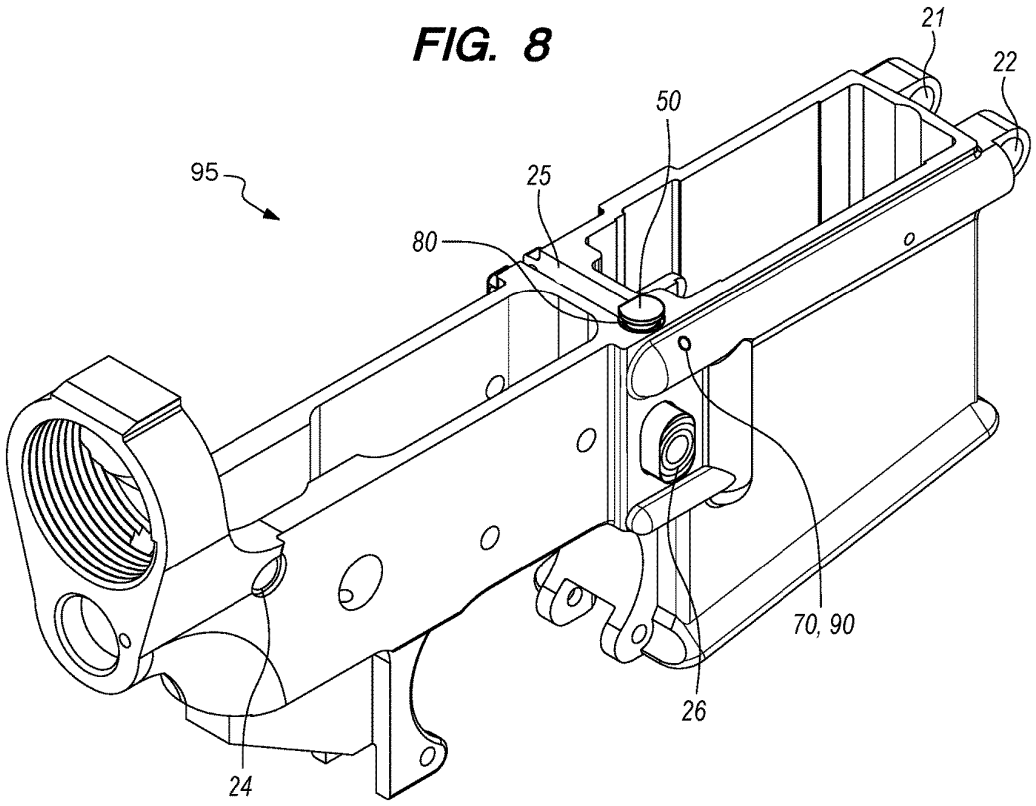


FIG. 9

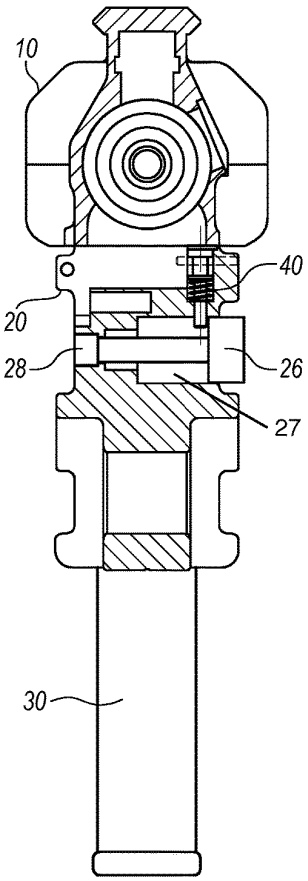


FIG. 10

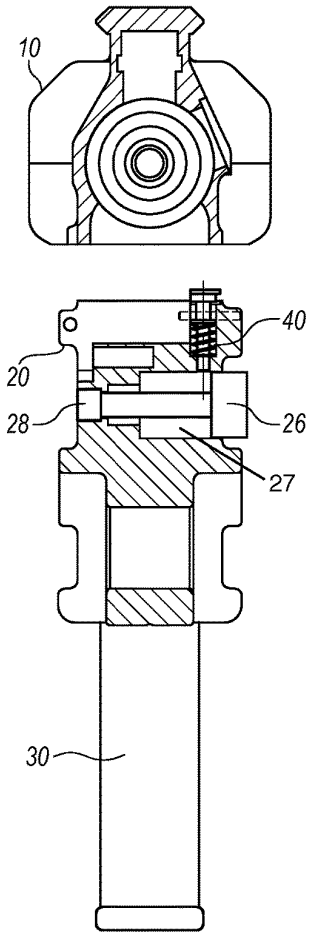


FIG. 11

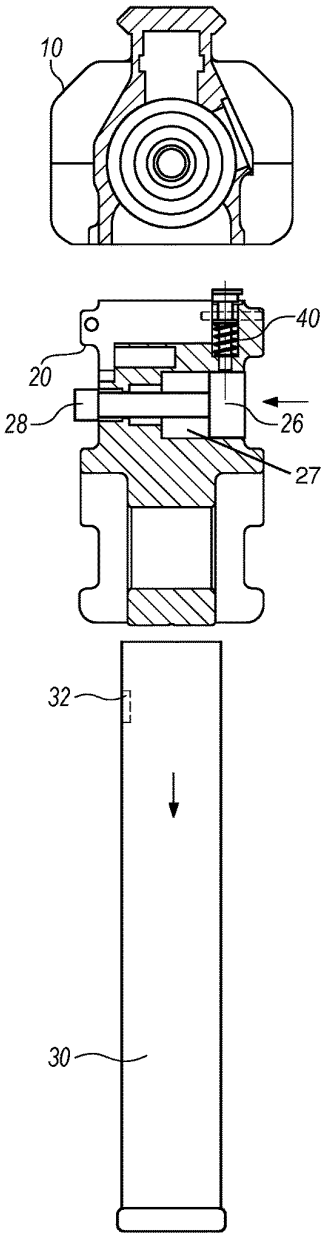


FIG. 12

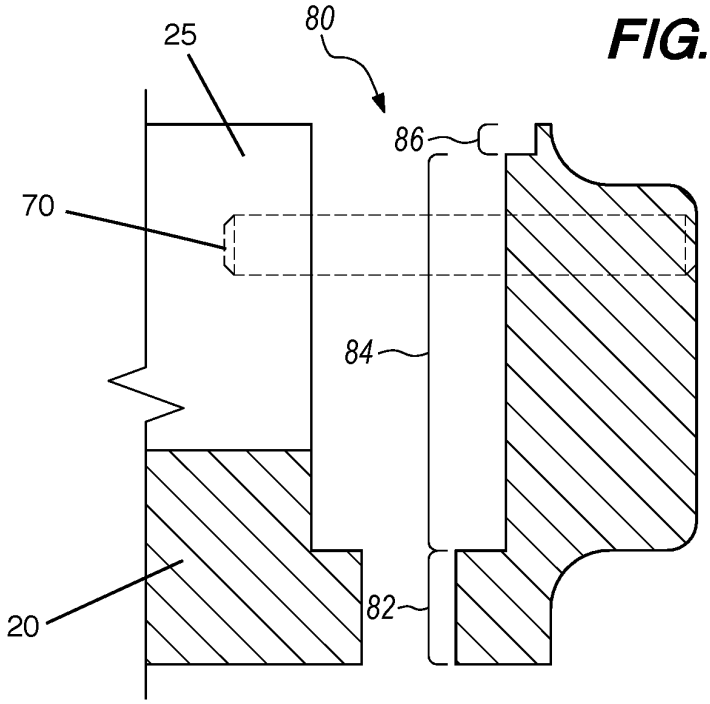
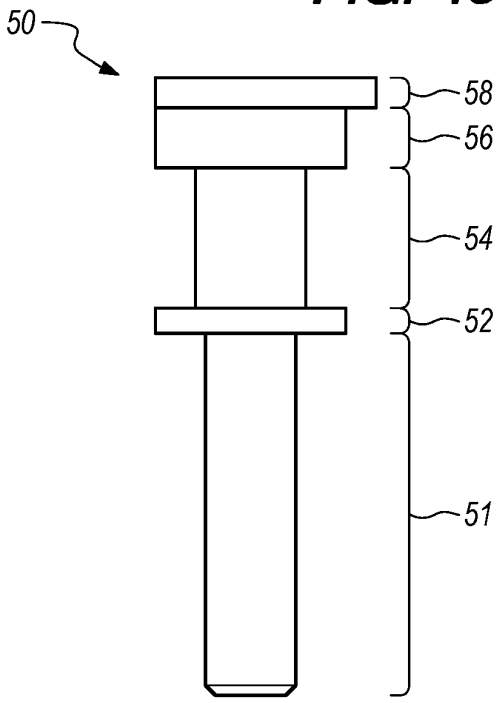


FIG. 13



MAGAZINE RELEASE BUTTON INTERFERENCE PIN ASSEMBLY AND AR-STYLE LOWER RECEIVER

CROSS-REFERENCE TO RELATED APPLICATIONS

The instant application is a continuation of U.S. application Ser. No. 15/611,703 entitled "Magazine Release Button Interference Pin Assembly and AR-Style Lower Receiver" filed on Jun. 19, 2018, which is hereby incorporated by reference herein.

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention pertains to an AR-Style rifle, which comprises an upper receiver assembly and a lower receiver assembly. This invention specifically pertains to the lower receiver assembly, which is the main component of an AR-Style rifle. This invention is a lower receiver of an AR-Style rifle that is machined for and fitted with a special magazine release button interference pin assembly. The special magazine release button interference pin assembly functions to prevent depression of the magazine release button when the upper receiver is closed onto or locked to the lower receiver, thereby preventing the release of the magazine from the rifle and preventing reloading of the rifle when the upper receiver is closed onto or locked to the lower receiver. The upper receiver must be closed or locked to the lower receiver in order to fire an AR-Style rifle because an AR-Style rifle will not fire with the upper receiver opened or pivoted away from the lower receiver. Also, the special magazine release button interference pin assembly functions to allow depression of the magazine release button when the upper receiver is opened, detached, or pivoted away from the lower receiver, thereby allowing release of the magazine from the rifle and reloading of the rifle when the upper receiver is opened, detached, or pivoted away from the lower receiver.

2. Description of Related Art

The AR-Style rifle was first developed in the 1950's by Eugene Stoner and the ArmaLite Company, which was a division of Fairchild Engine and Aircraft Corporation at that time. The AR stands for ArmaLite. ArmaLite developed many rifles with the designation of AR including: AR-5, AR-10, and AR-15. The AR-15 rifle design is the most widely used of the different AR-Style designs. In current times, many different companies manufacture and/or market AR-Style rifles in addition to the ArmaLite Company, which still remains a dominant producer of the AR-Style rifle. The magazine release button interference pin assembly of this invention functions with any AR-Style platform made by any manufacturer.

There are various mechanisms in the prior art that function to disallow depression of the magazine release button or release of the magazine catch on an AR-Style rifle. However, none include a magazine release button interference pin assembly as described here that functions to block depression of the magazine release button and release of the magazine catch when the upper receiver is closed or locked onto the lower receiver where this mechanism on the other hand removes the interference or blockage when the upper receiver is opened, detached, or pivoted away from the lower receiver.

BRIEF SUMMARY OF THE INVENTION

It is an aspect of this invention to provide a magazine release button interference pin that functions to interfere with or otherwise prevent the depression of the magazine release button of an AR-Style rifle when the upper receiver is closed or locked onto the lower receiver of the AR-Style rifle. It is an aspect if this invention to provide a magazine release button interference pin that functions to allow depression of the magazine release button of an AR-Style rifle when the upper receiver is opened or pivoted away from the lower receiver of the AR-Style rifle.

It is an aspect of a magazine release button interference pin to be spring loaded using a spring.

It is an aspect of a magazine release button interference pin to be installed into an interference pin hole machined into the lower receiver.

It is an aspect of a magazine release button interference pin to be locked into the lower receiver with a retaining pin.

It is an aspect of retaining pin to be installed into an retaining pin hole machined into the lower receiver.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a perspective view of an AR-Style rifle.

FIG. **2** is a front elevation view, a rear elevation view, a right side elevation view, a left side elevation view, a top plan view, and a bottom plan view of each component in magazine release button interference pin assembly. The front elevation view, rear elevation view, right side elevation view, and left side elevation view of magazine release button interference pin retaining pin are exactly the same. The right side elevation view and left side elevation view of magazine release button interference pin are the same. The front elevation view, rear elevation view, right side elevation view, and left side elevation view of magazine release button interference pin spring are exactly the same.

FIG. **3** is an exploded perspective view of magazine release button interference pin assembly.

FIG. **4** is a perspective view of magazine release button interference pin assembly.

FIG. **5** is an enlarged right side elevation view of an AR-Style rifle with the upper receiver closed onto and attached to the lower receiver with the takedown pin fully inserted. FIG. **5** also defines cross-sectional plane **9-9**.

FIG. **6** is an enlarged right side elevation view of an AR-Style rifle with the upper receiver opened or pivoted away from the lower receiver with the takedown pin removed. FIG. **6** also defines cross-sectional plane **10-10**.

FIG. **7** is a perspective view of a lower receiver machined for a magazine release button interference pin assembly with an exploded view of a magazine release button interference pin assembly.

FIG. **8** is a perspective view of a lower receiver machined for and fitted with a magazine release button interference pin assembly.

FIG. **9** is a cross-section view taken from line **9-9** in FIG. **5**.

FIG. **10** a cross-section view taken from line **10-10** in FIG. **6**.

FIG. **11** is FIG. **10** with the magazine release button depressed, to move magazine catch leftwards, to release magazine, which falls downwards and out of lower receiver.

FIG. **12** is an enlarged cross-sectional view of magazine release button interference pin hole in lower receiver that defines the various segments of magazine release button interference pin hole.

FIG. **13** is an enlarged cross-sectional view of magazine release button interference pin that defines the various segments and protrusions of magazine release button interference pin.

DEFINITION LIST

Term	Definition
10	AR-Style Upper Receiver
12	Pivot Pin Hole on Upper Receiver
14	Takedown Pin Hole on Upper Receiver
16	Pivot Pin
18	Takedown Pin
20	AR-Style Lower Receiver
21	First Pivot Pin Hole on Lower Receiver
22	Second Pivot Pin Hole on Lower Receiver
23	First Takedown Pin Hole on Lower Receiver
24	Second Takedown Pin Hole on Lower Receiver
25	Bolt Catch Slot
26	Magazine Release Button
27	Magazine Release Button Cavity
28	Magazine Catch
30	Magazine
32	Magazine Catch Notch
40	Magazine Release Button Interference Pin Assembly
50	Magazine Release Button Interference Pin (MRBIP)
51	First Segment on MRBIP
52	First Protrusion on MRBIP
54	Second Segment on MRBIP
56	Second Protrusion on MRBIP
58	Head on MRBIP
60	Magazine Release Button Interference Pin Spring
70	Magazine Release Button Interference Pin Retaining Pin
80	Magazine Release Button Interference Pin Hole
82	First Segment on MRBIP Hole
84	Second Segment on MRBIP Hole
86	Third Segment on MRBIP Hole
90	Magazine Release Button Interference Pin Retaining Pin Hole
95	AR-Style Lower Receiver with Magazine Release Button Interference Pin Assembly
100	AR-Style Rifle
102	Buttstock
104	Barrel

DETAILED DESCRIPTION OF THE INVENTION

An AR-Style rifle **100** comprises: various subcomponents such as pins, springs, fasteners, buttons, bushings, levers, grip, trigger, and various other components, which have come to be known as standard sub-components on every AR-Style rifle **100**. Among the standard sub-components on any AR-Style rifle **100** are: a buttstock **102** and a barrel **104**. A buttstock **102** is a rigid oblong member attached to the proximal end of lower receiver **20**. A barrel **104** is a rigid hollow cylindrical member attached to the distal end of upper receiver **10**.

Also among the standard subcomponents on any AR-Style rifle **100** are: an upper receiver **10** and a lower receiver **20**. Upper receiver **10** and lower receiver **20** are each standard components that are a component of every AR-Style rifle **100**. Upper receiver **10** and lower receiver **20** are each rigid oblong members with a longitudinal axis, a proximal end, a distal end, a left surface, a right surface, an upper surface, a lower surface, and various holes, cavities, threads, and other features that are present on every AR-Style rifle **100**. Upper receiver **10** and lower receiver **20**, each with their various holes, cavities, threads, and other features have come to be known as standard features on every AR-Style rifle **100**. The proximal end is defined as the end of subject component that is closest to the operator of the rifle or shooter. The distal end is defined as the end of the subject component that is farthest from the operator of the rifle or shooter. The right surface is defined as the surface of the subject component that faces the right side of the operator of the rifle or shooter. The left surface is defined as the surface of the subject component that is faces the left side the operator of the rifle or shooter. The upper surface is defined as the side of the subject component that faces upwards. The lower surface is defined as the side of the subject component that faces downwards.

Among the standard features on any upper receiver **10** are: a pivot pin hole **12** and a takedown pin hole **14**. Pivot pin hole **12** on upper receiver **10** is a cylindrical void on the lower surface of upper receiver **10** at the distal end. Pivot pin hole **12** has an inside diameter and a longitudinal axis that runs perpendicular to that of upper receiver **10**. Pivot pin hole **12** is located on a distal protrusion or finger member that protrudes downwards from the lower surface of upper receiver **10** at the distal end of the lower surface. Takedown pin hole **14** on upper receiver **10** is a cylindrical void on the lower surface of upper receiver **10** at the proximal end. Takedown pin hole **14** has an inside diameter and a longitudinal axis that runs perpendicular to that of upper receiver **10**. Takedown pin hole **14** is located on a proximal protrusion or finger member that protrudes downwards from the lower surface of upper receiver **10** at the proximal end of the lower surface. The inside diameter of pivot pin hole **12** on upper receiver **10** is equivalent to that of first and second pivot pin holes **21**,**22** on lower receiver **20**. The inside diameter of takedown pin hole **14** on upper receiver **10** is equivalent to that of first and second takedown pin holes **23**,**24** on lower receiver **20**.

Among the standard features on any lower receiver **20** are: a first pivot pin hole **21**, a second pivot pin hole **22**, a first takedown pin hole **23**, and a second takedown pin hole **24**. First and second pivot pin holes **21**,**22** on lower receiver **20** are each a cylindrical void on the distal end of lower receiver **20**. First and second pivot pin holes **21**,**22** each have an inside diameter and a longitudinal axis that runs perpendicular to that of lower receiver **20**. The longitudinal axis of first pivot pin hole **21** on lower receiver **20** is coincident with that of second pivot pin hole **22** on lower receiver **20**. The inside diameters of first and second pivot pin holes **21**,**22** are equivalent. First pivot pin hole pin **21** is located on a first protrusion or finger member that protrudes in the distal direction from the distal end of lower receiver **20**. First protrusion is located at the upper left corner of the distal end of lower receiver **20** as depicted. Second pivot pin hole pin **22** is located on a second protrusion or finger member that protrudes in the distal direction from the distal end of lower receiver **20**. Second protrusion is located at the upper right corner of the distal end of lower receiver **20** as depicted. First and second takedown pin holes **23**,**24** on the lower receiver **20** are each a cylindrical void through lower receiver located near the proximal end of lower receiver **20**. First and second takedown pin holes **23**,**24** each have an inside diameter and a longitudinal axis that runs perpendicular to that of lower receiver **20**. The longitudinal axis of first takedown pin hole **23** on lower receiver **20** is coincident with that of second takedown pin hole **24** on lower receiver **20**. The inside diameters of first and second takedown pin holes **23**,**24** are equivalent. First takedown pin hole **23** is

located on the left surface of lower receiver **20**, near the proximal end of lower receiver **20**, as depicted. Second takedown pin hole **24** is located on the right surface of lower receiver **20**, near the proximal end of lower receiver **20**, as depicted. There is a cavity between first and second takedown pin holes **23**,**24** as depicted that functions to provide clearance space for the trigger assembly (not depicted).

Also among the standard features on any lower receiver **20** is a bolt catch slot **25**. Bolt catch slot **25** is an oblong slot in upper surface of lower receiver **20** running perpendicular to the longitudinal axis of lower receiver **20**. Bolt catch slot **25** breaks through the left surface of lower receiver **20** as depicted. Bolt catch slot **25** does not break through the right surface of lower receiver **20** as depicted. Bolt catch slot **25** functions to provide clearance between a bolt catch (not depicted) and a bolt (not depicted). A bolt catch is fitted within bolt catch slot **25**. Bolt catch functions to catch the bolt in the reward position and to release of the bolt from the rearward position. The left end of bolt catch protrudes partially out of bolt catch slot **25** at the break through point on the left surface of lower receiver **20**. This left end protrusion functions as a button or lever with which to operate the bolt catch.

Also among the standard subcomponents on any AR-Style rifle **100** are: a magazine release button **26** and a magazine catch **28**. Magazine release button **26** is a spring-loaded button located on the right surface of lower receiver **20** as depicted. Magazine release button **26** is spring-loaded by a magazine catch spring (not depicted) that functions to push or force the magazine release button **26** in the "out" position, but allows the magazine release button **26** to be depressed to the "in" position under the standard pressure of pushing on the magazine release button **26** with your finger. The "out" position of magazine release button **26** is towards the right in FIGS. **9-11**. The "in" position of magazine release button **26** is towards the left in FIGS. **9-11**. Magazine catch **28** is a solid rigid member that functions to attach onto or lock into a magazine catch notch **32** on a magazine **30** when magazine release button **26** is in the "out" position and to detach from or release from magazine catch notch **32** on magazine **30** when magazine release button **26** is in the "in" position. Magazine release button **26** is mechanically linked to magazine catch **28** through magazine catch spring. When magazine release button **26** is depressed, it forces magazine catch spring to push magazine catch **28** outwards from the left surface of lower receiver **20** and or toward the left in FIGS. **9-11**, thereby removing magazine catch **28** from its insertion point in magazine catch notch **32**.

Also among the standard subcomponents on any AR-Style rifle **100** are: a magazine **30** with a magazine catch notch **32**. Magazine **30** is a container or housing that stores bullets of rounds of ammunition (not depicted). Magazine **30** functions to store bullets and feed a bullet one at a time into a chamber to fire the bullet from the rifle **100**. Magazine **30** has a proximal end, a distal end, a left surface, a right surface, an upper opening, and a lower surface. Magazine catch notch **32** is a notch, slot, or depression in the left surface of magazine **30** near the upper end of the left surface as depicted. As stated above, magazine catch **28** locks into or attaches within magazine catch notch **32** when magazine release button **26** is at rest, and releases from or detaches from magazine catch notch **32** when magazine release button **26** is depressed.

Also among the standard subcomponents on any AR-Style rifle **100** are: a pivot pin **16** and a takedown pin **18**. Pivot pin **16** is a solid rigid cylindrical member with an outer diameter, a first end, and a second end. The outside diameter of pivot pin **16** is sized to make a slip fit or press fit with the inside diameter of pivot pin hole **12** on upper receiver **10** and the inside diameters of first and second pivot pin holes **23**,**24** on lower receiver **20**. The first end of pivot pin **16** has no head. The second end of pivot pin **16** has a head with an outside diameter that is larger than the inside diameter of first and second pivot pin holes **23**,**24** on lower receiver **20**. Takedown pin **18** is a solid rigid cylindrical member with an outer diameter, a first end, and a second end. The outside diameter of takedown pin **18** is sized to make a slip fit or press fit with the inside diameter of takedown pin hole **14** on the upper receiver **10** and the inside diameters of the first and second takedown pin holes **23**,**24** on the lower receiver **20**. The first end of takedown pin **18** has no head. The second end of takedown pin **18** has a head with an outside diameter that is larger than the inside diameter of first and second takedown pin holes **23**,**24** on lower receiver. As with all AR-Style rifles **100**, the upper receiver **10** is pivotally attached to the lower receiver **20** with pivot pin **16**. In order to pivotally attach upper receiver **10** to lower receiver **20**, the longitudinal axis of pivot pin hole **12** on upper receiver **10** is aligned with that of first and second pivot pin holes **21**,**22** on lower receiver **20** so that the distal protrusion on upper receiver **10** is placed between the first and second protrusions on lower receiver **20**. Then the first end of pivot pin **16** is inserted through the second pivot pin hole **22** on lower receiver **20**, pivot pin hole **12** on upper receiver **10**, and first pivot pin hole **21** on lower receiver **20** until the head on the second end of pivot pin **16** contacts the right surface of lower receiver **20**. Pivotal attachment is such that a hinge is formed between the upper receiver **10** and the lower receiver **20** with the pivot pin **16** acting as a hinge pin.

As with all AR-Style rifles **100**, after the upper receiver **10** has been pivotally attached to the lower receiver **20**, the upper receiver **10** is locked onto the lower receiver **20** using takedown pin **18**. The upper receiver **10** must be locked onto lower receiver **20** in order to fire the rifle **100**. In order to lock the upper receiver **10** onto the lower receiver **20**, the longitudinal axis of takedown pin hole **14** on upper receiver **10** is aligned with that of first and second takedown pin holes **23**,**24** on lower receiver **20** so that the proximal protrusion on upper receiver **10** is located in the void or cavity between first and second takedown pin holes **23**,**24**. Then the first end of takedown pin **18** is inserted through the second takedown pin hole **24** on lower receiver **20**, takedown pin hole **14** on upper receiver **10**, and first takedown pin hole **23** on lower receiver **20** until the head on the second end of takedown pin **18** contacts the right of surface lower receiver **20**. This attachment is such that the upper receiver **10** is locked onto the lower receiver **20** with rigid and strong attachment by pivot pin **16** and takedown pin **18**.

As with all AR-Style rifles **100**, in order to unlock upper receiver **10** from lower receiver **20**, the operator must press the first end of takedown pin **18** out of: first takedown pin hole **23**, takedown pin hole **14**, and second takedown pin hole **24** to eject takedown pin **18** from these holes. This allows the proximal end of upper receiver **10** to be pivoted upwards and away from the proximal end of lower receiver **20** where pivoting occurs around pivot pin **16**.

As with all AR-Style rifles **100**, in order to remove upper receiver **10** from lower receiver **20**, the operator must press the first end of pivot pin **16** out of: first pivot pin hole **21** and second pivot pin hole **22** to eject pivot pin **16** from these holes. This allows the upper receiver **10** to be removed from the lower receiver **20**. The takedown pin **18** must also be removed in order to remove upper receiver from lower receiver **20**.

Prior art AR-Style rifles **100** contain all items described in the above portion of the detailed description. Prior art AR-Style rifles **100** do not contain the magazine release button interference pin assembly **40** as described below. Also, prior art lower receivers **20** do not include the magazine release button interference pin hole **80** and magazine release button interference pin retaining pin hole **90** as described below. FIGS. **7-8** depict an AR-Style lower receiver with magazine release button interference pin assembly **95**.

Magazine release button interference pin assembly **40** comprises: a magazine release button interference pin **50**, a magazine release button interference pin spring **60**, and a magazine release button interference pin retaining pin **70**.

Magazine release button interference pin **50** is a solid rigid oblong member comprising: a first segment **51**, a first protrusion **52**, a second segment **54**, and a second protrusion **56**. Magazine release button interference pin **50** is made from a solid and durable material such as metal, metal alloy, steel alloy, ceramic, or other material. In best mode, magazine release button interference pin **50** is made of steel alloy. First segment **51** is contiguous with first protrusion **52**, which is contiguous with second segment **54**, which is contiguous with a second protrusion **56**, as depicted. All together, first segment **51**, first protrusion **52**, second segment **54**, and second protrusion **56** comprise the solid rigid oblong member. Magazine release button interference pin **50** has an overall length that is the sum of lengths/thicknesses of all segments **51**,**52**,**54**,**56**. In best mode, first segment **51**, first protrusion **52**, second segment **54**, and second protrusion **56** are part of the same piece of material and have been machined from one piece of material. Magazine release button interference pin **50** functions to interfere with or otherwise prevent the depression of magazine release button **26** when the upper receiver **10** is closed or locked onto the lower receiver **20**, but allow the depression thereof when the upper receiver **10** is opened or pivoted away from the lower receiver **10**.

First segment **51** is a solid rigid cylindrical member with a length, a diameter, a longitudinal axis, a side, an upper end, and a lower end. The length of first segment **51** is 0.2-0.8 inches. The diameter of first segment **51** is 0.025-0.200 inches. The longitudinal axis runs through the longitudinal center of the cylindrical member. First segment **51** functions to interfere with the function of the magazine release button **26** when in the lower position.

First protrusion **52** is a solid rigid cylindrical member with a thickness, an outside diameter, a center point, an upper surface, and a lower surface. The thickness of first protrusion **52** is 0.01-0.5 inches. The outside diameter of first protrusion **52** is 0.100-0.300 inches. The outside diameter of first protrusion **52** is larger than the diameters of first and second segments **51**,**54**. The longitudinal axis of first segment **51** is coincident with the center point of first protrusion **52**. The upper end of first segment **51** is contiguous with and rigidly attached to the lower surface of first protrusion **52**. In best mode, first segment **51** and first protrusion **52** are made from the same piece of material. First protrusion **52** functions to retain magazine release button interference pin spring **60** within magazine release button interference pin hole **80** below first protrusion **52**. First protrusion **52** functions to also retain magazine release button interference pin **50** within magazine release button interference pin hole **80** when the upper receiver **10** is opened, detached, or pivoted away from the lower receiver **20**.

Second segment **54** is a solid rigid cylindrical member with a length, a diameter, a longitudinal axis, an upper end, and a lower end. The length of second segment **54** is 0.05-0.5 inches. The diameter of second segment **54** is 0.025-0.200 inches. The longitudinal axis runs through the longitudinal center of the cylindrical member. First segment **51** and second segment **54** may have the same diameter. In best mode, first segment **51** and second segment **54** have the same diameter. The upper surface of first protrusion **52** is contiguous with and rigidly attached to the lower end of second segment **54**. The longitudinal axis of first segment **51** is coincident with that of second protrusion **56**. In best mode, first protrusion **52** and second segment **54** are made from the same piece of material.

Second protrusion **56** is a solid rigid cylindrical member with a thickness, an outside diameter, a center point, an upper end, and a lower surface. The thickness of second protrusion **56** is 0.01-0.5 inches. The outside diameter of second protrusion **56** is 0.100-0.300 inches. The outside diameter of second protrusion **56** is larger than the diameters of first and second segments **51**,**54**. The longitudinal axis of second segment **54** is coincident with the center point of second protrusion **56**. First protrusion **52** and second protrusion **56** may have the same outside diameter. In best mode, first protrusion **52** and second protrusion **56** have the same outside diameter. The upper end of second segment **54** is contiguous with and rigidly attached to the lower surface of second protrusion **56**. In best mode, second segment **54** and second protrusion **56** are made from the same piece of material. Second protrusion **56** functions to prevent the magazine release button interference pin **50** from moving too far downwards to press against or bottom out on the magazine release button **26** when magazine release button interference pin **50** is in the lower position. The upper end of second protrusion **56** is flush with the upper surface of lower receiver **20** when magazine release button interference pin **50** is in the lower position.

Optionally, magazine release button interference pin **50** may further comprise a head **58**. Head **58** is not required for successful functioning of the invention but adds to the esthetics of magazine release button interference pin assembly **40** when installed into lower receiver **20** by eliminating any gaps between magazine release button interference pin **50** and magazine release button interference pin hole **80**. Head **58** is a solid rigid cylindrical member with a thickness, an outside diameter, a center point, a keyed side, an upper surface, and a lower surface. The upper end of head **58** is flush with the upper surface of lower receiver **20** when magazine release button interference pin **50** is in the lower position. The thickness of head **58** is 0.01-0.1 inches. The outside diameter of head **58** is 0.100-0.500 inches. The center points of first protrusion **52**, second protrusions **56**, and head **58** are each coincident with the longitudinal axes of first and second segments **51**,**54**. Keyed side is a portion of the side of cylindrical member that has been removed to yield a straight edge. Keyed side is a straight edge on one side of the cylindrical member. The keyed side is required to provide clearance for the bolt catch (not depicted) and bolt catch slot **25**. Without the keyed side on head **58**, head **58** would overhang into the space occupied by the bolt catch slot **25** to interfere with the motion of the bolt catch within the bolt catch slot **25**. The outside diameter of head **58** must be larger than that of second protrusion **56**. The upper end of second protrusion **56** is contiguous with and rigidly attached to the lower surface of head **58**. In best mode, second protrusion **56** and head **58** are made from the same piece of material.

Magazine release button interference pin spring **60** is helical spring or coil spring with a length, a diameter, a longitudinal axis, an upper end, and a lower end. Magazine release button interference pin spring **60** is a typical or standard helical spring or coil spring. The length of magazine release button interference pin spring **60** is 0.150-0.600 inches. The length of magazine release button interference pin spring **60** is about the same as the length of first segment **51**. The diameter of magazine release button interference pin spring **60** is 0.050-0.300 inches. The longitudinal axis of magazine release button interference pin spring **60** runs through the longitudinal center of magazine release button interference pin spring **60**. The longitudinal axes of first and second segments **51**,**52** are concentric with the longitudinal axis of magazine release button interference pin spring **60**. Magazine release button interference pin spring **60** functions to apply upward pressure or force on the magazine release button interference pin **50** to push and move magazine release button interference pin **50** upwards when the upper receiver **10** is opened, detached, or pivoted away from the lower receiver **20**. Magazine release button interference pin spring **60** is installed over first segment **51** as described below.

Magazine release button interference pin retaining pin **70** is a solid rigid cylindrical member with a length, a diameter, a longitudinal axis, a left end, a right end, an upper surface, and a lower surface. The length of cylindrical member is 0.100-0.600 inches. The length of magazine release button interference pin retaining pin **70** must be long enough so magazine release button interference pin retaining pin **70** penetrates into the bolt catch slot **25** when installed into a lower receiver **20**. The diameter of cylindrical member is 0.020-0.250 inches. The diameter of magazine release button interference pin retaining pin **70** must be less than the length of second segment **54**. Magazine release button interference pin retaining pin **70** is made from a solid and durable material such as metal, metal alloy, steel alloy, ceramic, or other material. Magazine release button interference pin retaining pin **70** functions to retain magazine release button interference pin **50** within magazine release button interference pin hole **80** when the upper receiver **10** is opened, detached, or pivoted away from the lower receiver **20** and magazine release button interference pin when spring **60** pushes magazine release button interference pin **50** upwards. The upper surface of first protrusion **52** rests against or contacts the lower surface of magazine release button interference pin **50** to facilitate this retention. In best mode, magazine release button interference pin retaining pin **70** is made of steel alloy.

Magazine release button interference pin hole **80** is a specially shaped hole or void that has been machined into the lower receiver **20**. Magazine release button interference pin hole **80** comprises: a first segment **82** and a second segment **84**.

First segment **82** is a cylindrical hole or cavity in lower receiver **20** with a length, an inside diameter, a longitudinal axis, an upper end, and a lower end. The length of first segment **82** is 10-45 percent of that of first segment **51** of magazine release button interference pin **50**. The inside diameter of first segment **82** is sized to make a slip-fit with the outside diameter of the first segment **51** of magazine release button interference pin **50**. "Slip-fit" is a commonly known engineering classification that is defined as a sliding clearance fit between a pin and a hole where the hole has a diameter just slightly larger than that of the pin so that the pin may slide into and out of the hole with finger pressure. First segment **82** is the deepest section of magazine release button interference pin hole **80**.

Second segment **84** is a cylindrical hole or cavity in lower receiver **20** with a length, an inside diameter, a longitudinal axis, an upper end, and a lower end. The length of second segment **84** is 60-90 percent of the overall length of magazine release button interference pin **50**. The inside diameter of second segment **84** is sized to make a slip-fit with the outside diameter of first protrusion **52** or first and second protrusion **52**,**56** on magazine release button interference pin **50**. The inside diameter of second segment **84** is larger than that of first segment **82**. The upper end of first segment **82** of magazine release button interference pin hole **80** is contiguous with the lower end of second segment **84** of magazine release button interference pin hole **80**. The cavity of first segment **82** is contiguous with the cavity of second segment **84** to make one continuous cavity as depicted. The longitudinal axis of first segment **82** is coincident with that of second segment **84**.

The longitudinal axis of magazine release button interference pin hole **80** is perpendicular to the longitudinal axis of lower receiver **20**. The lower end of first segment **82** of magazine release button interference pin hole **80** breaks out into the magazine release button cavity **27**. The magazine release button cavity **27** is a cavity that is a standard features on every AR-Style rifle **100**. The magazine release button cavity **27** is a cavity machined into lower receiver **20**. The magazine release button **26** is installed into the magazine release button cavity **27**. The magazine release button cavity **27** provides clearance space for the magazine release button **26** to be depressed and released or operated. FIGS. **9** and **10** depict magazine release button **26** and magazine release button cavity **27** when magazine release button **26** is in the released position. FIG. **11** depicts magazine release button **26** and magazine release button cavity **27** when magazine release button **26** is in the depressed position. The upper end of second segment **84** breaks out through the upper surface of lower receiver **20** without optional third segment **86** as described below. In best mode, a longitudinal section or portion of second segment **84** breaks out into the bolt catch slot **25** as depicted but this is not required for successful functioning of the invention.

Optionally, magazine release button interference pin hole **80** may further comprise a third segment **86**. Third segment **86** provides clearance for head **58** on magazine release button interference pin **50**. Third segment **86** is only required when head **58** is optionally included on magazine release button interference pin **50**. Third segment **86** is a cylindrical hole or cavity in lower receiver **20** with a length, an inside diameter, a longitudinal axis, an upper end, and a lower end. The length of third segment **86** is the thickness of the head **58** of magazine release button interference pin **50**, or just slightly longer than that. The inside diameter of third segment **86** is sized to make a slip-fit with the outside diameter of head **58** on magazine release button interference pin **50**. The inside diameter of third segment **86** is larger than that of second segment **84**. The upper end of second segment **84** of magazine release button interference pin hole **80** is contiguous with the lower end of third segment **86** of magazine release button interference pin hole **80**. The cavity of second segment **84** is contiguous with the cavity of third segment **86** to make one continuous cavity as depicted. The longitudinal axis of second segment **84** is coincident with that of third segment **86**. The upper end of third segment **86** breaks out through the upper surface of lower receiver **20**. In best mode, a longitudinal section or portion of third segment

86 breaks out into the bolt catch slot 25 as depicted but this is not required for successful functioning of the invention.

Magazine release button interference pin retaining pin hole 90 is a cylindrical hole or cavity in lower receiver 20 with a length, an inside diameter, a longitudinal axis, an left end, and a right end. The length of magazine release button interference pin retaining pin hole 90 is 25-75 percent of that of magazine release button interference pin retaining pin 70. The inside diameter of magazine release button interference pin retaining pin hole 90 is sized to make a slip-fit or press fit with the outside diameter of magazine release button interference pin retaining pin 70. "Press fit" is a commonly known engineering classification that is defined as interference fit between a pin and a hole where the hole has a diameter just slightly smaller than that of the pin so that the pin must be pressed with force greater than that of finger pressure in order to insert or remove the pin from the hole, where a hammer and punch tool are typically used to remove and insert the pin. The longitudinal axis of magazine release button interference pin retaining pin hole 90 is perpendicular to that of magazine release button interference pin hole 80. Magazine release button interference pin retaining pin hole 90 is positioned and located on lower receiver 20 so that its left end breaks out into the magazine release button interference pin hole 80 as depicted and so that its right end breaks out of the right surface of lower receiver 20 as depicted.

Magazine release button interference pin assembly 40 is installed into a specially machined lower receiver 20 as follows. Magazine release button interference pin spring 60 is positioned over first segment 51 of magazine release button interference pin 50 by sliding the upper end of magazine release button interference pin spring 60 onto the lower end of first segment 51 and sliding the upper end of magazine release button interference pin spring 60 upwards until it rests against or contacts the lower surface of first protrusion 52 of magazine release button interference pin 50. To install magazine release button interference pin 50 and magazine release button interference pin spring 60 into specially machined lower receiver 20, the lower end of first segment 51 of magazine release button interference pin 50 is inserted into the upper end of third segment 86 of magazine release button interference pin hole 80 and the magazine release button interference pin 50 is pressed downwards until the lower surface of head 58 on magazine release button interference pin 50 contacts or rests against the lower end of third segment 86 of magazine release button interference pin hole 80 or seats within the third segment 86 of magazine release button interference pin hole 80. You must keep continuous downward pressure on magazine release button interference pin 50 to install magazine release button interference pin retaining pin 70. To install the magazine release button interference pin retaining pin 70, the left end of magazine release button interference pin retaining pin 70 is inserted into the right end of magazine release button interference pin retaining pin hole 90 and the magazine release button interference pin retaining pin 70 is pressed into magazine release button interference pin retaining pin hole 90 until the right end of magazine release button interference pin retaining pin 70 is flush with the right surface of lower receiver 20. As stated, the length of magazine release button interference pin retaining pin 70 must be long enough to break out into magazine release button interference hole 80. With the magazine release button interference pin retaining pin 70 installed, you can release the continuous downward pressure on magazine release button interference pin 50. If magazine release button interference pin assembly 40 is properly installed, when downward pressure on magazine release button interference pin 50 is released, the upper surface of first protrusion 52 of magazine release button interference pin 50 rests against the lower surface of magazine release button interference pin retaining pin 70 to retain magazine release button interference pin 50 within magazine release button interference pin hole 80 as depicted in FIGS. 10 and 11. This is designated as the upper position of magazine release button interference pin 50. If magazine release button interference pin assembly 40 is properly installed, when the upper receiver 10 is closed onto or locked to the lower receiver 20, continuous downward pressure is applied to magazine release button interference pin 50 to force magazine release button interference pin 50 downwards so that the lower end of first segment 51 of magazine release button interference pin 50 breaks out into magazine release button cavity 27 as depicted in FIG. 9. This is designated as the lower position of magazine release button interference pin 50.

When magazine release button interference pin 50 is in the lower position, magazine release button 26 may not be depressed because the side of first segment 51 of magazine release button interference pin 50 interferes with or blocks the path of depression of the magazine release button 26. When magazine release button interference pin 50 is in the lower position and magazine release button 26 is in the released position, there is no contact between the side of first segment 51 and the magazine release button 26. Contact between the magazine release button 26 and magazine release button interference pin 50 only occurs when magazine release button interference pin 50 is in the lower position and magazine release button interference pin 50 is depressed. When magazine release button interference pin 50 is in the lower position and magazine release button interference pin 50 is depressed, the magazine release button 26 contacts the side of first segment 51. The lower end of first segment 51 is prevented from contacting the magazine release button 26 when magazine release button interference pin 50 is in the lower position, because the lower surface of second protrusion 56 of magazine release button interference pin 50 contacts the upper surface of magazine release button interference pin retaining pin 70 to prevent the lower end of magazine release button interference pin 50 from moving downwards far enough to contact the magazine release button 26. When magazine release button interference pin 50 is in the upper position, magazine release button 26 may be depressed because magazine release button interference pin 50 does not interfere with or block the path of depression of magazine release button 26.

What is claimed is:

1. A magazine release button interference pin assembly comprising: a magazine release button interference pin; a magazine release button interference pin spring; and a magazine release button interference pin retaining pin; wherein,

said magazine release button interference pin is a solid rigid oblong member with: a first segment; a first protrusion; a second segment; and a second protrusion; wherein,

said first segment is a solid rigid cylindrical member with a length, a diameter, a longitudinal axis, an upper end, and a lower end,

said first protrusion is a solid rigid cylindrical member a thickness, an outside diameter, a center point, an upper surface, and a lower surface,

said outside diameter of said first protrusion is larger than said diameter of said first segment and said diameter of said second segment,

said longitudinal axis of said first segment is coincident with said center point of said first protrusion,

said upper end of said first segment is contiguous with and rigidly attached to said lower surface of said first protrusion,

said second segment is a solid rigid cylindrical member with a length, a diameter, a longitudinal axis, an upper end, and a lower end,

said upper surface of said first protrusion is contiguous with and rigidly attached to said lower end of said second segment,

said longitudinal axis of said first segment is coincident with said longitudinal axis of said second protrusion,

said second protrusion is a solid rigid cylindrical member with a thickness, an outside diameter, a center point, an upper end, and a lower surface,

said outside diameter of said second protrusion is larger than said diameter of said first segment and said diameter of said second segment,

said longitudinal axis of said second segment is coincident with said center point of said second protrusion,

said upper end of said second segment is contiguous with and rigidly attached to said lower surface of said second protrusion,

said magazine release button interference pin spring is a helical spring or coil spring with a length, a diameter, a longitudinal axis, an upper end, and a lower end,

said diameter of said magazine release button interference pin spring is larger than said diameter of said first segment,

said magazine release button interference pin retaining pin is a solid rigid cylindrical member with a length, a diameter, a longitudinal axis, a left end, a right end, an upper surface, and a lower surface, and

said diameter of said magazine release button interference pin retaining pin is less than said length of said second segment.

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