March 5, 1963 H. D. ALLYN 3,079,718

FIRING MECHANISM WITH VARIABLE CONTACT SEAR NOTCH

Filed May 19, 1959 5 Sheets-Sheet 1

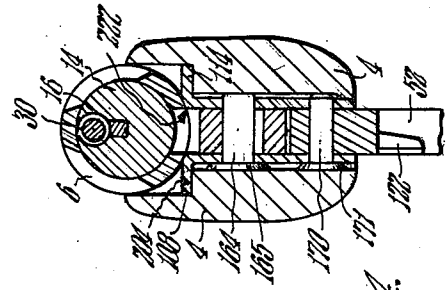


Fig. 4.

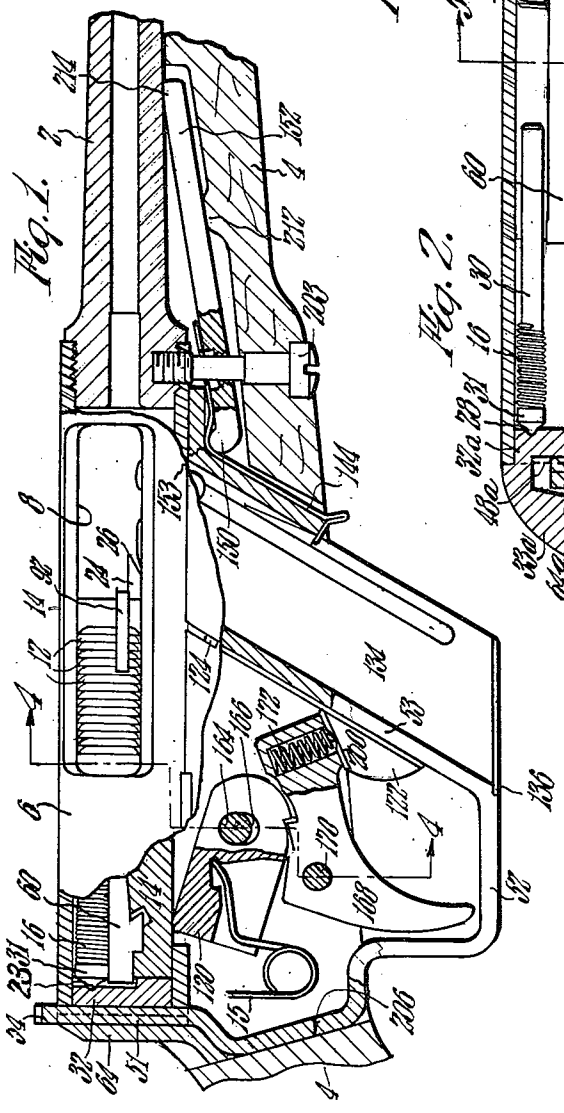


Fig. 1.

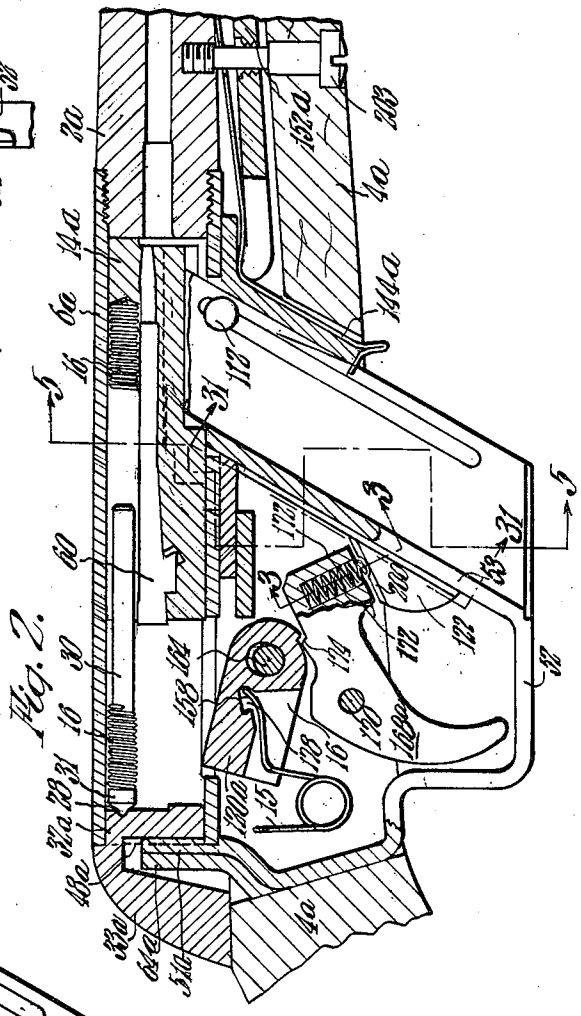


Fig. 2.

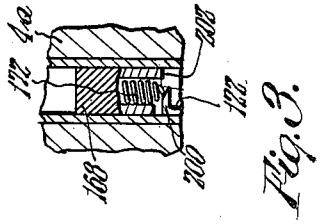


Fig. 3.

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March 5, 1963 H. D. ALLYN 3,079,718

FIRING MECHANISM WITH VARIABLE CONTACT SEAR NOTCH

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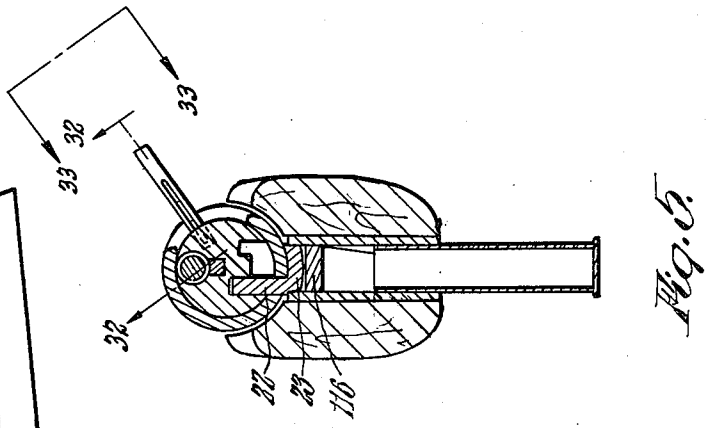


Fig. 5.

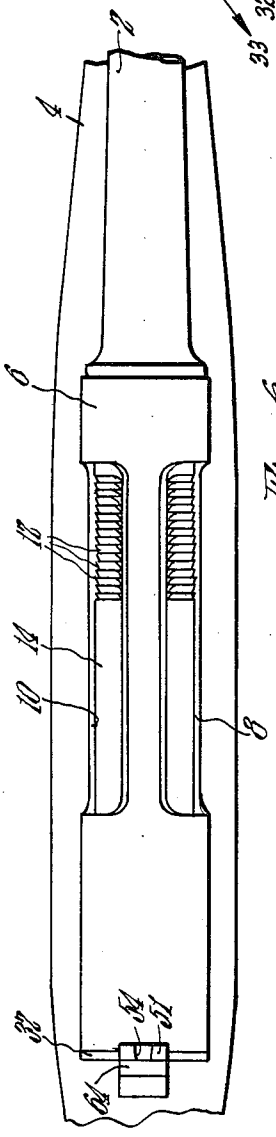


Fig. 6.

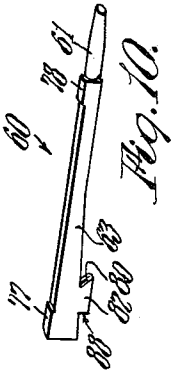


Fig. 10.

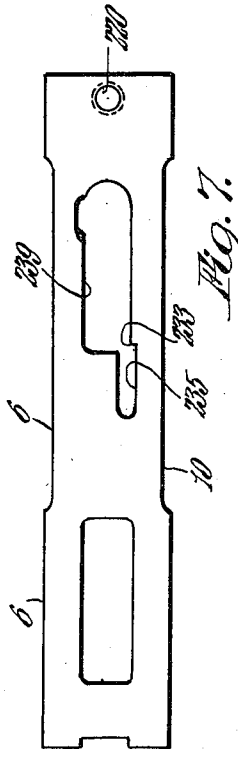


Fig. 7.

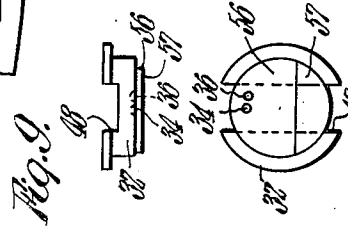


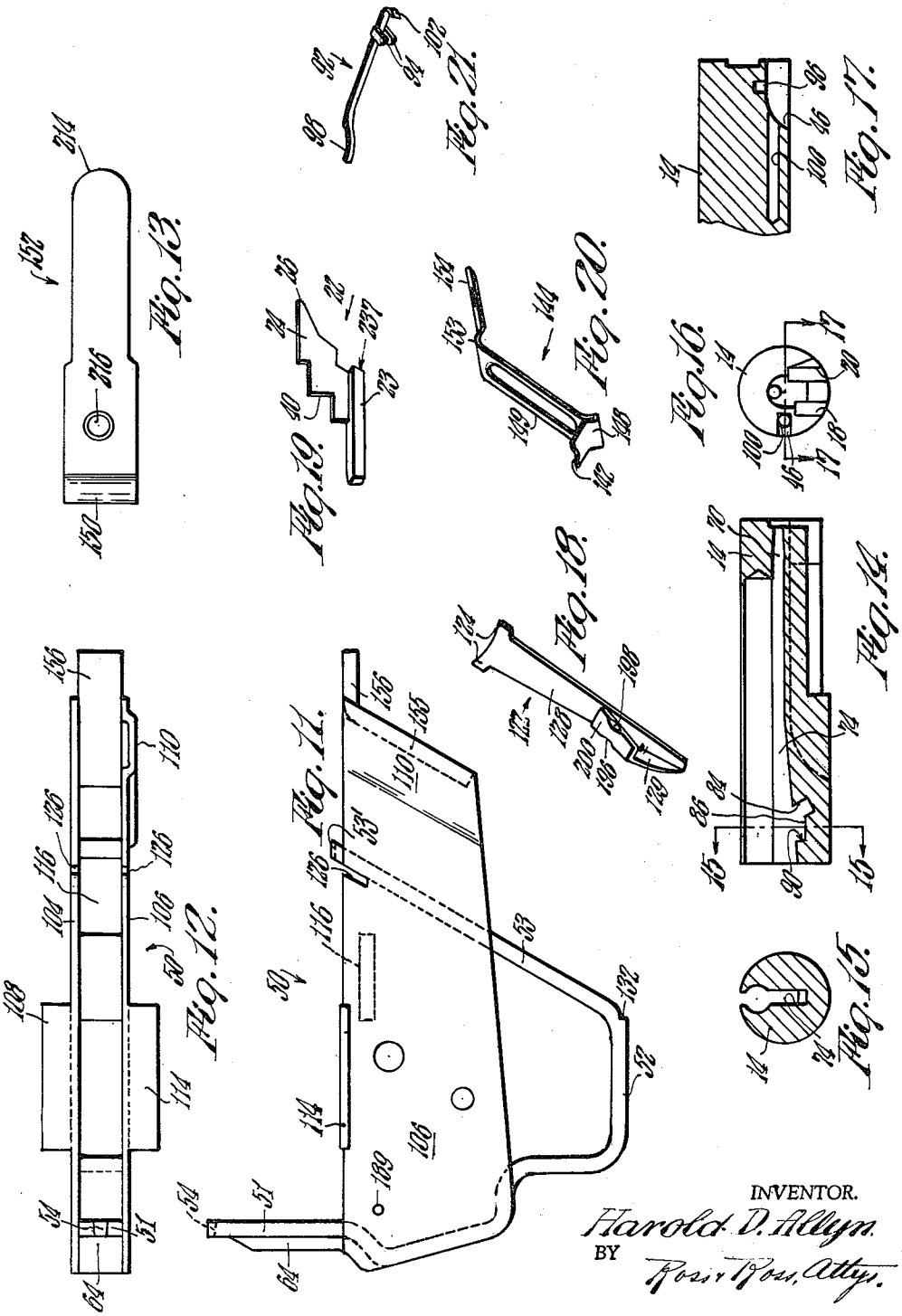
Fig. 9. Fig. 8.

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FIRING MECHANISM WITH VARIABLE CONTACT SEAR NOTCH

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FIRING MECHANISM WITH VARIABLE CONTACT SEAR NOTCH

Filed May 19, 1959 5 Sheets-Sheet 4

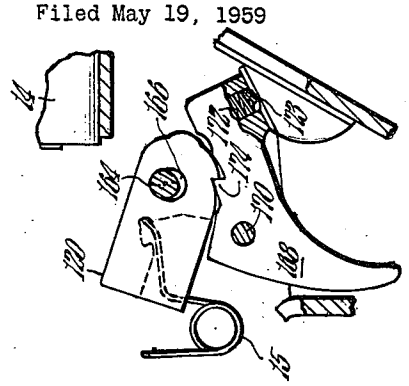


Fig. 24.

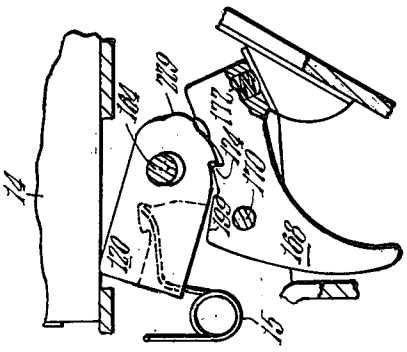


Fig. 25.

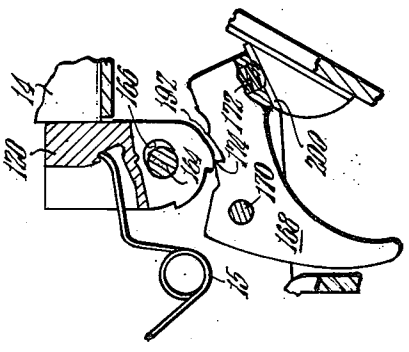


Fig. 26.

Fig. 27.

Fig. 28.

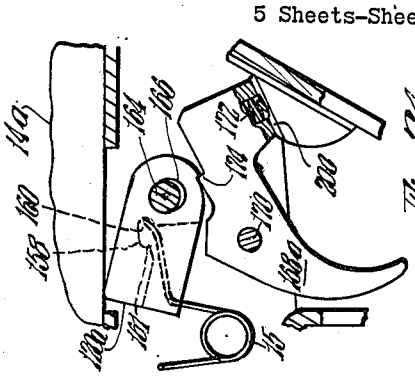


Fig. 29.

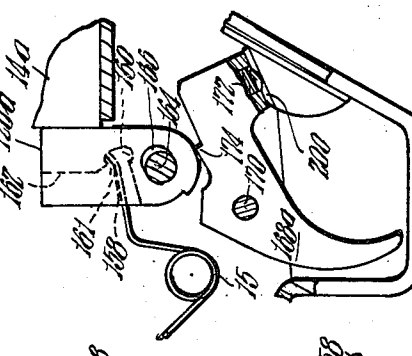


Fig. 30.

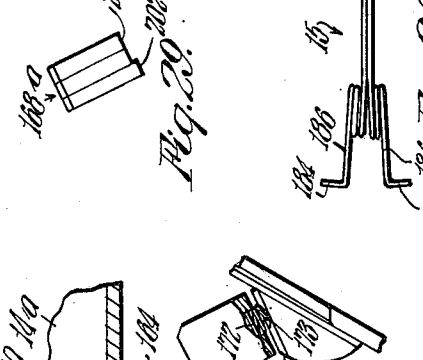


Fig. 31.

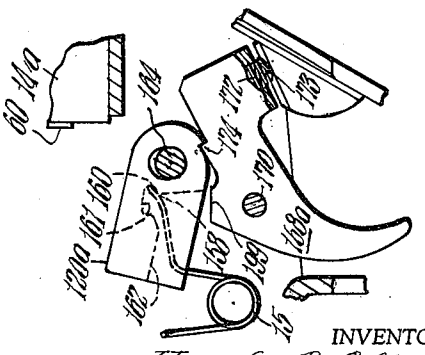


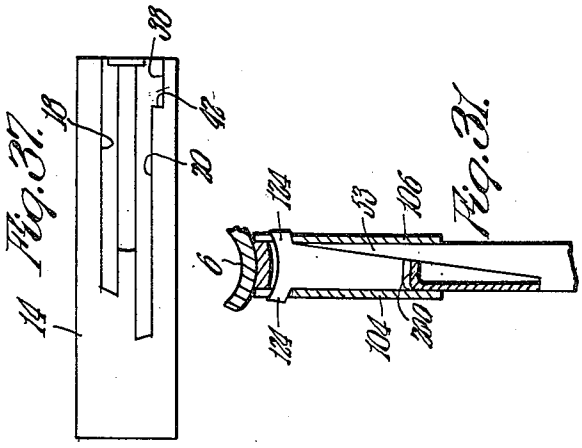
Fig. 32.

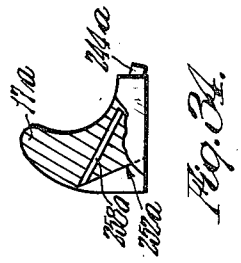
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BY Poss & Poss, Attys

March 5, 1963 H. D. ALLYN 3,079,718

FIRING MECHANISM WITH VARIABLE CONTACT SEAR NOTCH

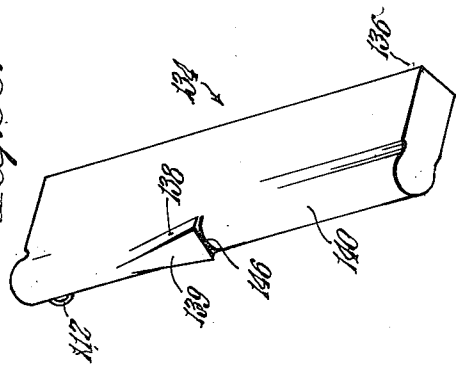
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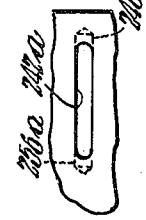


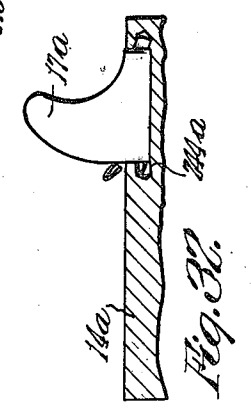


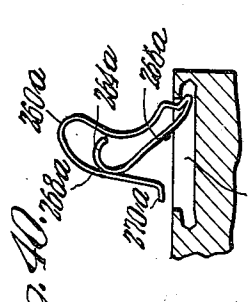


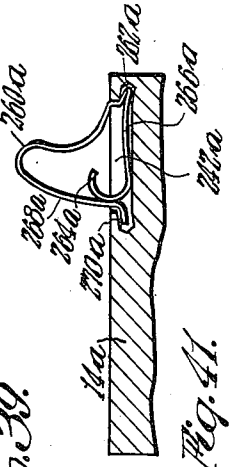














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BY
Voss & Voss, Attys

United States Patent Office 3,079,718 Patented Mar. 5, 1963

3,079,718

FIRING MECHANISM WITH VARIABLE CONTACT SEAR NOTCH

Harold D. Allyn, 10 Sumner Ave., Springfield, Mass.

Filed May 19, 1959, Ser. No. 814,219
1 Claim. (Cl. 42—69)

This invention relates to improvements in structural refinements in breech loading firearms. It is directed more particularly to improvements in firearms of the inertia block, blow-back semi-automatic type.

The invention resides in the particular arrangement, construction and relationship of certain components of firearms of the above defined type, as exemplified in the detailed disclosure hereinafter set forth, wherein the below recited objects of the invention will be apparent, its concept having been with attendant manufacturing problems fully in mind and with special regard to the possibility of using components made from stampings and screw machine parts.

It is a primary object hereof to provide a firearm mechanism by means of which a manufacturer may be able to produce two firearms for the tooling costs of but one. Thus either a small game and plinking semi-automatic rifle or a semi-automatic target or plinking pistol may be made which incorporates the same basic mechanism with minor changes, representing relatively small tooling costs, being necessitated in a change-over from the production of one to the other. It is not contemplated, however, that the ultimate purchaser will be similarly able to convert the form of his firearm.

To make the manufacture of firearms a more profitable undertaking, the mechanism embodying the essence of the invention has been designed in such manner as to be simple in its construction, the usual complexity of components having been so greatly reduced, as to offer a fundamentally new concept in the combining and coacting of firearm parts. Further, while the components are uniquely compact, they are nevertheless readily accessible for maintenance and replacement purposes.

By the present invention, I provide advantageous structural and operational features in firearms leading to their simplicity in construction, adaptability to economical manufacture, and efficiency and dependability in operational use, all resulting in important distinct advantages in economy of manufacture, ease of operation, reliability of performance, and the like.

Although the firearm hereof may be a pistol or a rifle of the semi-automatic type, they are without separate sear or disconnector mechanisms and are of such design that no movement can be sensed with the trigger upon recoil of the breech bolt.

A variable contact sear notch is so incorporated into the trigger mechanism that upon firing and with the trigger held back, a sear point of the trigger reaches deeply into a complemental sear notch of the hammer so as not to jar off therefrom during counter recoil. Such a deep seated contact, under conditions as exemplified in known prior art constructions, would expectedly produce an objectionably long, heavy and creepy pull of the trigger. Here however, when the trigger is actuated forwardly, preparatory to firing, the sear point of the trigger jumps from its deep contact in the hammer notch to a relatively shallow contact to the end that only a short light, crisp pull is needed. With the trigger contacting a large area on the hammer sear notch during the shock of autoloading, some of the normal component wear is avoided. Additionally, all of such action is accomplished without the employment of any additional components.

By the employment of a bedding plate and a cooperating assembly screw, I am able to maintain the receiver-barrel assembly, housing assembly, magazine catch, ejector and stock, in a locked-together relation as a single immovable unit, all without any direct contact between the housing assembly and the assembly screw. Hereby, the components can be readily disassembled without tools save for a screw driver, coin, or like implement which may be used to remove the single assembly screw.

The invention has been described herein with particular reference to semi-automatic rifles and pistols, but it will be appreciated that its principles of design and their application extend beyond the particular types illustrated. They comprehend the features set forth when incorporated in types of firearms, other than semi-automatic rifles and pistols, whether gas or recoil operated, and whether of the pump, lever or other type.

Other objects and advantages will be in part obvious or in part pointed out hereinafter and will become apparent as the detailed description proceeds below. They reside in features of novelty and details of construction and operation to be pointed out more fully hereinafter and with particularity in the claim annexed to and forming a part hereof. To the accomplishment of these ends, the invention intended to be protected by Letters Patent will be understood to comprise the features set forth herein and in the annexed drawings illustrating certain physical embodiments of the invention arranged and combined in accordance with two modes which I have devised for the practical application of the principles hereof.

It is to be understood, however, that this is only indicative of but two of the various ways in which the principles of the invention may be employed and in which the component parts may be combined and arranged. In other words, the precise constructions of the drawings need not be slavishly followed. Conceivably, certain components might have to be modified in accordance with a particular use to which the firearm is to be put. Changes, modifications and alterations are obviously contemplated and may be made and resort had to substitutions, all within the spirit and scope hereof.

In the accompanying drawings:

FIG. 1 is a vertical longitudinal cross-sectional view taken through a breech mechanism of a semi-automatic pistol constructed in accordance with the present invention, with the breech bolt in the rearward or retracted position;

FIG. 2 is a vertical longitudinal cross-sectional view taken through a breech mechanism of a semi-automatic rifle constructed in accordance with the present invention, with the breech bolt in the forward or battery position and with the hammer cocked;

FIG. 3 is a sectional view on the line 3—3 of FIG. 2;

FIG. 4 is a sectional view on the line 4—4 of FIG. 1;

FIG. 5 is a sectional view on the line 5—5 of FIG. 2;

FIG. 6 is a top plan view of the breech mechanism shown in FIG. 1;

FIG. 7 is a bottom plan view of the receiver component of the pistol;

FIG. 8 is a front end view of the rear cap component;

FIG. 9 is a top plan view of the rear cap component shown in FIG. 8;

FIG. 10 is a perspective view of the firing pin component;

FIG. 11 is a side elevational view of the housing assembly;

FIG. 12 is a top plan view of the housing assembly shown in FIG. 11;

FIG. 13 is a top plan view of the bedding plate component;

FIG. 14 is a longitudinal sectional view of the breech bolt component;

FIG. 15 is a sectional view on the line 15—15 of FIG. 14;

FIG. 16 is a front end elevational view of the breech bolt component shown in FIG. 14;

FIG. 17 is a partial sectional view on the line 17—17 of FIG. 16 showing the front end portion of the breech bolt;

FIG. 18 is a perspective view of the safety component;

FIG. 19 is a perspective view of the ejector component;

FIG. 20 is a perspective view of the magazine catch component;

FIG. 21 is a perspective view of the extractor component;

FIGS. 22–24 are fragmentary elevational views of the hammer-trigger mechanism as applied to a rifle for purposes of showing the relationship of certain components during various stages of the firing cycle;

FIGS. 25–28 are fragmentary elevational views of the hammer-trigger mechanism as applied to a pistol for purposes of showing the relationship of certain components during various stages of the firing cycles;

FIG. 29 is an elevational view of the forward end face of the trigger component shown in FIG. 22;

FIG. 30 is a top plan view of the hammer spring component;

FIG. 31 is a sectional view on the line 31—31 of FIG. 2;

FIG. 32 is a sectional view on the line 32—32 of FIG. 5;

FIG. 33 is a view on the line 33—33 of FIG. 5 with the bolt handle removed;

FIG. 34 is a cross sectional view of the rifle bolt handle component;

FIG. 35 is a rear end elevational view of the rifle bolt handle component;

FIG. 36 is a perspective view of the rifle bolt handle retaining spring component;

FIG. 37 is a bottom plan view of the breech bolt;

FIG. 38 is a perspective view of the magazine component;

FIG. 39 is a side elevational view of a modified spring type bolt handle component which may be employed in the rifle hereof;

FIG. 40 is a sectional elevational view of the rifle breech bolt showing the modified form of spring type bolt handle being assembled into operative position; and

FIG. 41 is a sectional elevational view of the rifle breech bolt showing the modified form of spring type bolt handle in its assembled operative position.

In the following description and in the appended claim, various components and details thereof will be identified by specific names for purposes of convenience. Such names, however, are intended to be as generic in their application as the art will permit.

In the numbering of parts, where the components are used inter-changeably in the rifle and pistol, same carry the same number. However, where any design change is involved, regardless of how slight such change may be, the component is numbered in the case of the pistol and the counterpart component is numbered and lettered in the case of the rifle. For example, the pistol barrel is identified as 2 and the rifle barrel is identified as 2*a*.

In cases where a component is peculiar to the rifle alone, such component is numbered and lettered, with no counterpart component bearing the number alone being shown in the case of the pistol.

Referring now to the drawings more in detail, I have shown, in FIG. 1, the general outline of a breech mechanism incorporated into a pistol. Certain parts are broken away for the sake of clarity.

The pistol includes the usual barrel 2, a stock 4, and a receiver 6.

The stock 4 may be formed of wood, plastic or equivalent material. There being no necessity for tangs, straps or other limiting factors, the grip of the stock may assume any desired shape. For example, it may correspond to the grip of the free pistol, the flint lock or percussion pistol, the modern double-action revolver, or the western type single-action revolver. Contrariwise, it may be provided in the form of a block so that the customer may fashion it according to his personal desires.

The receiver 6 is preferably round in cross section, though it may be of any other desired shape, and is provided with a breech bolt bore extending therethrough along the longitudinal axis thereof and communicating with the bore of the barrel 2, the barrel and receiver being threadedly engageable with, or pinned to, each other, as desired.

As best observed in FIG. 6, the upper portion of the receiver is provided with a pair of elongated, parallel and spaced, grasping slots extending therethrough and communicating with the breech bolt bore; a right hand grasping slot 8 and a left hand grasping slot 10. As will hereinafter appear, slot 8 functions additionally as an ejector port.

A plurality of spaced, parallel, circumferentially-arranged, grasping grooves 12 are provided on the surface of the forward portion of the breech bolt 14, which breech bolt reciprocates within the receiver during recoil and counter recoil in known manner. The grooves facilitate the grasping of the breech bolt through the grasping slots 8 and 10 of the receiver for its manual retraction rearwardly against the tension of a hammer spring 15 and a recoil spring 16 and its rotation relative to the receiver when it is desired to hold it in the retracted position, as will be observed.

The breech bolt will be observed to be completely enclosed within the receiver.

The weight of the breech bolt is such as to retard recoil action sufficiently to allow the bullet to leave the barrel before the breech bolt is moved rearwardly any appreciable extent.

The hammer spring 15 will be described in greater detail subsequently. The recoil spring 16 is receivable in an elongated recoil spring bore extending into the breech bolt 14 from the rear end thereof and along its longitudinal axis, the forward end of the spring confronting the forward end of said bore. The spring encircles the shank 30 of an elongated recoil spring guide in such manner that the rearward end of the spring abuts against the shoulder of the head 31 of said recoil spring guide. Said shank 30 is of such length as to extend into the recoil spring bore of the breech bolt sufficiently far, at all positions of the breech bolt, to function as a guide for the recoil spring.

In the case of the rifle, shown in FIG. 2, same includes a barrel 2*a*, a stock 4*a*, and a receiver 6*a*. The stock 4*a* is preferably of the one-piece type, as in the case of the pistol. Designwise, it may be similar to any contemporary semi-automatic rifle stock. The grasping grooves in the breech bolt and the left hand grasping slot in the receiver are omitted in the case of the rifle, their functions being better served by a bolt handle 17*a*, which may be observed in FIGS. 32, 34 and 35 and in a modified form in FIGS. 39, 40 and 41.

The hammer spring 15 and the recoil spring 16 are of identical design and function in the cases of both the pistol and rifle.

An ejector, generally designated by 22 in FIG. 19, has a horizontally extending base portion 23 and a vertically extending guide portion 24 fixed thereto or integral therewith at one end thereof. The guide portion 24 is slidably receivable in a left hand magazine clearance cut 20 of the breech bolt 14 (see FIGS. 5, 16 and 37) where it functions to prevent unwanted rotation of the breech bolt within the receiver.

A forwardly-pointing projection 26 at the top of the guide portion 24 of the ejector will be observed, in FIG. 1, to overhang the rear top portion of the magazine assembly, to be hereinafter described, for ejecting spent cartridges through the right hand grasping slot 8.

The method of retaining the ejector 22, which also

serves as a breech bolt guide, relative to its related components, will be subsequently explained.

To hold the breech bolt 14 in the retracted or open position, same may be retracted manually to the extreme rearward position and rotated slightly in a counterclockwise direction. A rearwardly facing detent 28 of the head 31 of the recoil spring guide is provided and abuts the forward face of the rear cap 32.

As in FIG. 8, the forward face of the rear cap 32 is provided with a pair of detent notches. A right hand notch 34 serves to receive the detent 28 of the recoil spring guide when the breech bolt is in the operating position, and a left hand notch 36 serves to receive the detent 28 when the breech bolt has been rotated, in the aforesaid counterclockwise direction for holding same in the held-back position.

The upper portion 56 of the forward face of the rear cap 32 is cut away or inset from the lower portion 57 so as to allow a clearance for the rearward end of the firing pin 60 when the breech bolt is in the retracted position, as best shown in FIG. 1. Alternatively, an opening may be drilled into the forward face of the rear cap for this purpose.

The recoil spring guide is held under the tension of the recoil spring with the detent 28 being selectively nestable in one of the detent notches in the rear cap.

It must be here explained, with reference to FIGS. 16 and 37, that the forward portion of the under side of the breech bolt 14 is provided with a right hand magazine clearance cut 18 and a left hand magazine clearance cut 20. These cuts extend vertically upwardly into the breech bolt body. A lowermost and forwardmost portion 38 of the left hand magazine clearance cut 20 is cut away to facilitate this rotation of the breech bolt to the left, and to provide a shoulder 42 in the breech bolt for holding same in the held-back or open position due to the contact of said shoulder 42 against a rearwardly facing flat surface 40 on the guide portion 24 of the ejector 22, shown in FIG. 19.

During the rotational movement of the breech bolt to hold same in the rearward position, the spherical point of the detent 28 of the recoil spring guide is rotated in an arc from nesting position in the detent notch 34 to nesting position in the detent notch 36 whereat it aids in holding the breech bolt in the held-back position of rotation and in preventing the breech bolt shoulder 42 from being jarred off of the flat surface 40 of the ejector 22.

To release the breech bolt from said held-back position, it is only necessary to rotate it clockwise to the right so as to disengage said shoulder 42 from said surface 40 and to return the detent 28 from nesting position in the left hand detent notch 36 to nesting position in the right hand detent notch 34. So released, the breech bolt is then allowed to move forwardly to battery under the tension of the recoil spring 16.

The right hand detent notch 34 also serves to guide the breech bolt 14 in its operating position momentarily when, at its rearward position, the breech bolt is too far rearwardly of the ejector 22 so that the ejector cannot function as a guide in the left hand magazine clearance cut 20.

With reference to the rifle, the bolt handle 17*a* serves as a means for gripping the breech bolt 14*a* to effect this rotation with a corresponding result.

In the pistol, an extractor slot 46 is provided, as in FIGS. 16 and 17, for receiving the ejector. This also allows the fingers to obtain a non-slip grip on the breech bolt 14 for effectuating the rotation thereof. A non-slip horizontal groove (not shown) may be cut in the left side of the breech bolt to assist further in the gripping action.

In FIG. 8, the rear cap 32 is shown as provided with a rearwardly-facing, vertically-extending slot 48 for nestably receiving the uppermost and rearmost extremity 51 of a generally U-shaped spacer of the housing assembly, to be subsequently described. Said extremity 51 of the spacer is defined as a rear housing extension and is a rearwardly-disposed, substantially vertically-extending, portion thereof. Its lower end merges into the rear end of the trigger guard portion 52 of the spacer and the forward end of the trigger guard portion merges into the lower end of a rear magazine wall portion 53 of the spacer.

The rear housing extension 51 supports the rear cap against the recoiling of the breech bolt, said rear cap being juxtaposed forwardly thereof and being positioned within the rear end of the receiver, as shown in FIG. 1. To strengthen the member 51 for resistance to repeated blows of the recoiling breech bolt, a reinforcement member 64 may be fixed to the rear housing extension. See FIGS. 1, 6, 11 and 12.

If desired, the rearward face of the rear cap 32 may be rounded or otherwise formed so as to present a streamlined appearance.

The uppermost horizontally disposed edge of the rear housing extension 51 is provided with a notch 54 extending transversely thereacross and functioning as a rear sight notch. See FIG. 6.

In the case of the rifle of FIG. 2, the rear cap 32*a* is likewise receivable within the rear end of the receiver, but differs in that the vertically extending slot 48*a* does not extend through the cap. An end cap member 33*a* is secured to the rear face of the rear cap 32*a* above and adjacent the slot 48*a*, and encloses the upper extremity of the rear housing extension 51*a* and the reinforcement member 64*a* (which are not as long as their counterparts 51 and 64 in the pistol) and it has an outermost rounded surface offering a streamlined appearance. The end cap member 33*a* and the rear cap 32*a* may be unitary, if desired.

The shortening of the rear housing extension 51*a* and of the reinforcement 64*a* is the only difference in the housing assemblies of the pistol and rifle.

The rear housing extension 51*a* not extending above the horizontal plane of the upper surface of the receiver 6*a* so as to provide a rear sight, as in the case of the pistol, a separate rear sight may be mounted on the top of the receiver or on the barrel in the well known manner.

The before-mentioned firing pin component will now be described. It is generally indicated by the numeral 60 in FIG. 10 and includes a cylindrically-shaped forward end portion 61 and a flat-sided portion 63 rearwardly thereof. The forward end portion is receivable in a firing pin opening 70 and the flatsided portion is receivable in an aligned firing pin slot 74 in the breech bolt. See FIGS. 14 and 15. The slot 74 is disposed vertically below and in communication with the recoil spring bore. The top planar surface of the firing pin 60 is relieved so that only a rear end portion 77 and a forward end portion 78 extend upwardly thereabove, which portions bear upwardly against the recoil spring 16 aligned thereabove.

To prevent the rear end of the firing pin from jumping upwardly, as same is driven forwardly by the hammer (to be later described) and/or from exerting any undue pressure on the bottom of the recoil spring 16, an angle cut 80 is provided on the forward face of a downwardly depending firing pin retaining lug 82 for mating with a complemental undercut 84 on the front end of a firing pin retaining cut 86 in the breech bolt 14, as shown in FIG. 14.

When the hammer has driven the firing pin 60 to its forwardmost position, the angle cut 80 strikes the undercut 84 so as to prevent any upward movement of the firing pin. A rearward face 88 of the firing pin retaining lug 82 strikes a complemental rearward face 90 of the firing pin retaining cut 86 in the breech bolt 14 to limit any rearward movement of the firing pin 60.

The extractor is generally indicated by the numeral 92 in FIG. 21 and comprises a unitary structure, made pref-

erably from a stamping to provide a lug 94 extending outwardly in a direction transverse to its longitudinal axis. The lug consists of a pair of ears on opposite sides of the extractor body, which permit the confrontation of the lug into the firing pin retaining opening 96 in the breech bolt, as shown in FIG. 17.

The rearward extremity or tail 98 of the extractor 92 is bent, as shown, to provide a spring tension when the extractor is placed in the extractor opening 100 in the breech bolt. Same permits the flexing of its forward extremity with the movement of the lug 94 into and out of locking position in the opening 96.

The forwardmost end portion of the extractor 92 is bent in the form of an extractor hook 102 and is juxtaposed adjacent the forward face of the breech bolt, all as is known.

With reference to FIG. 4, a hammer pin 164 is shown as provided with an enlarged head 165. A trigger pin 170 is shown as provided with an enlarged head 171. The heads 165 and 171 are adapted to bear against an inner wall of the hollowed stock 4 so as to retain said pins relative to the housing.

The housing assembly, generally indicated as 50 in FIGS. 11 and 12, is made from cold finish sheet stock and is of such configuration as to have a pair of spaced vertically extending, side plates, a left hand side plate 104 and a right hand side plate 106, fixed to opposite sides of the aforedescribed spacer.

The left hand side plate is provided with an outwardly extending left hand bedding ear 108. The right hand side plate is provided with an outwardly extending offset 110 to provide a clearance for the usual magazine loading button 112 (see FIG. 2) and an outwardly extending right hand bedding ear 114.

The bedding ears 108 and 114 extend at right angles to the upper edge of the respective side plates and provide rigidity and stiffness thereto.

The side plates may be made from sheet metal stampings, which stampings may be welded, riveted, brazed or otherwise secured to the spacer therebetween. Alternatively, the housing assembly may be made unitary in any desired manner.

As shown in FIG. 5, an ejector support 116 extends as a web transversely between the side plates 104 and 106 and provides a support for the lowermost or under surface of the base portion 23 of the ejector 22, when said ejector is locked in position upon assembly. Said web 116 also acts as a forward stop for the hammer 120, when the housing assembly is disassembled from the receiver-barrel assembly.

A safety, generally indicated by the numeral 122 in FIG. 18, is provided with a pair of outwardly and oppositely extending ears 124. The bottoms of said ears are nestable in the respective safety slots 126 provided oppositely in the side plates 104 and 106 of the housing assembly. The slots are so formed as to enable the flat portion 128 of the safety 122 to lie against the rear magazine wall portion 53 of the spacer. See FIG. 31.

A finger portion 129 of the safety extends outwardly from the lower end of the flat portion 128 so as to facilitate manual engagement thereof as will appear subsequently. A shelf 200 extends angularly outwardly from the flat portion 128 of the safety and may comprise an inwardly turned portion of the finger.

A left hand detent cut 196 is provided on one side edge of the shelf 200 and a right hand detent cut 198 is provided in the opposite side edge thereof.

The magazine assembly, generally indicated by 134 in FIG. 38, is conventional in structure and is releasably held in the usual cavity, as will appear.

An outwardly extending rear wall extension 136 of the rear wall of the magazine assembly functions as a stop when the magazine assembly is inserted into the firearm by engaging in a magazine stop notch 132 provided in the lower front face of the trigger guard portion 52 of the spacer of the housing assembly.

A magazine catch 144, shown in FIG. 20, comprises a rearwardly extending portion 142, a forwardly extending finger portion 148 and a slotted midsection 149 extending transverse to and upwardly from the portions 142 and 148 and terminating at its opposite and upper end in a bend 153 and a forwardly extending portion 154.

When the magazine assembly is inserted into the firearm, camming surfaces 138 on opposite sides of a magazine retaining projection 139, which extends outwardly from the forward wall 140 of the magazine assembly, cam the slotted midsection 149 so that it flexes and urges the rearwardly extending portion 142 forwardly.

When the magazine assembly is fully in place, the rearwardly extending portion 142 snaps rearwardly due to its inherent spring tension and catches beneath a lowermost portion 146 of the magazine retaining projection 139 so as to lock the magazine assembly in place.

Conversely, a forward pressure on the finger portion 148 of the magazine catch releases the magazine assembly so that same may thereupon be withdrawn from the gun.

Midsection 149 of the magazine catch being slotted, same may be easily flexed.

The magazine catch is held in place by the upper rounded rear end 150 of a bedding plate 152 bearing upwardly against the lower portion of the bend 153 in the magazine catch, which in turn bears upwardly on the lower portion of the forwardly facing bend 156 at the top of the front wall 155 of the housing assembly disposed between the side plates 104 and 106. See FIG. 11.

The aforementioned bedding plate is generally designated as 152, in FIG. 13, where it is shown as being a bar of generally rectangular shape. It could be otherwise in configuration, as for example, channel shaped, thereby effecting a reduction in the weight thereof as well as strengthening same.

The trigger mechanism of the herein disclosed pistol is shown as being of the variable contact sear notch type (FIGS. 1 and 25–28) and the trigger mechanism of the herein disclosed rifle is shown as being of the conventional sear notch type (FIGS. 2 and 22–24). It is to be understood however that the systems may be used interchangeably on pistols and rifles. As semi-automatic rifles generally possess hard and creepy pulls and as light and crispy pulls are especially desirable for pistols, the variable contact sear notch offering the superior pull is herein shown in connection with the pistol.

In the rifle of FIGS. 2 and 22, the breech bolt 14*a* is illustrated as being in its forward position and the hammer 120*a* as being under the full tension of the hammer spring 15 so that the weapon is cocked in a ready-to-fire position.

The hammer 120*a* is bifurcated at the rearward lowermost portion thereof to provide a slot 162 at the upper, inner corner of which a socket of corresponding width is provided in communication therewith much in the form of a pocket. The pocket will be observed to have a forward or bottom rounded wall portion 160 and a rearward or top rounded wall portion 161, which wall portions are connected by a relatively long and straight connecting wall portion.

The forwardly extending end portion 158 of the hammer spring 15 will be observed to be extendable through the slot 162 and into the socket of the hammer 120*a*.

In said FIG. 22, the end portion 158 is seated against the bottom wall portion 160 of the socket. The transversely extending hammer pin 164 is disposed at the bottom or normal position in an elongated pivot slot 166 in the hammer 120*a*.

When the trigger 168*a* is pulled rearwardly, it pivots on the transversely extending trigger pin 170 so as to compress the trigger spring 172. Said spring is of the coil type and has an inner portion nested within a downwardly-

facing opening in the forward portion of the trigger. The uppermost coil of such inner portion is opened out slightly so as to cause the inner portion to be retained within the opening. The outer end of the trigger spring extends outwardly, beyond the face of the trigger and has a lowermost detent portion, the function of which will be hereinafter explained.

Simultaneously with the rearward pull of the trigger, the sear point 174 on the upper face of the trigger traverses in an arc downwardly out of its mating relationship with a complemental sear notch in the hammer 120*a* whereby the hammer is caused to fall under the tension of the hammer spring.

As the hammer falls, the upwardly bent end portion 158 of the hammer spring rides from the bottom wall portion 160 along the connecting wall portion to the rear wall portion 161 of the socket to the position, shown in FIG. 23, where the hammer is in the down position, having struck the rear end of the firing pin 60, so that the cartridge is discharged and the breech bolt 14*a* is ready to start its recoil rearwardly.

The hammer pin 164 is at the bottom, or normal, position in the elongated pivot slot 166 and the trigger 168 is held back.

In a blow-back type of firearm, considerable hammer spring pressure is desirable when the face of the hammer is embraced against the breech bolt, so as to enable the force, required for the initial cocking of the hammer, to assist the breech bolt in retarding the force of the explosion. It is also desirable however, to have less hammer spring pressure, when the hammer is in the full cocked position, all to reduce the sear notch pressure and to prevent the upper face of the hammer from binding on the lower portion of the breech bolt during counter recoil.

The closer the end portion 158 of the hammer spring is to the hammer pin 164, the more favorable the leverage for cocking the hammer and compressing the spring.

With the end portion 158 in the rear wall portion 161 of the socket, as in FIG. 23, the spring is in its most unfavorable leverage position relative to the cocking of the hammer.

As the hammer approaches full cock, the end portion 158 of the hammer spring rides along the wall of the pocket. When full cock is reached, the end portion is disposed in the bottom wall portion 160 of the pocket, as shown in FIGS. 2 and 24. Here the spring presses upwardly on the hammer against the breech bolt with its most unfavorable leverage.

A small notch not shown may be cut in the upper forward portion of the pocket to maintain the end portion 158 of the hammer spring in the top portion of the pocket for a longer period while the hammer is being cocked. With this notch, as the hammer approaches full cock, a point is reached where the upper forward portion of the hammer spring is no longer retained by the notch and it immediately snaps downwardly to the bottom of the pocket.

The hammer spring 15 is shown, in FIG. 30, as being of the mouse-trap type. The rear end is provided with a pair of outwardly protruding ears 184, which are pivotally receivable in complementary openings 189 in the opposite side walls of the housing assembly and are held therein by the outward inherent spring tension of the legs 186 of the spring.

As the hammer is being cocked, the top portion 158 of the hammer spring exerts an upward pressure, and also a forward pressure, on the hammer, keeping the hammer pin 164 bearing on the lower portion of the elongated pivot slot 166.

Immediately before the hammer reaches full cock, the end portion 158 of the hammer spring initiates a downward, and also a forward, pressure, so as to urge the hammer to jump downwardly along the elongated pivot slot 166. The hammer pin 164 is now in the top portion of the elongated pivot slot 166. The sear notch in the hammer 120*a* is thus enabled to contact the sear point 174 of the trigger 168*a* so as to hold the hammer in the full cock position as the breech bolt counter-recoils. During this interval, the trigger 168*a* is held to the rear.

As shown in FIG. 24, the breech bolt 14*a* is in the rearmost position immediately before it reciprocates forwardly. As is well known during this counter-recoil, a cartridge is stripped from the top of the magazine assembly and is loaded into the breech.

When the trigger 168*a* is released, the trigger spring 172 urges the finger portion of the trigger forwardly. The front portion of the trigger is thus rotated upwardly so as to drive the hammer upwardly along the elongated pivot slot 166, and to overcome the downward pressure exerted by the end portion 158 of the hammer spring.

In other words, the hammer moves in relation to the hammer pin from a position where the hammer pin is in the top of the elongated pivot slot 166 (as shown in FIG. 24) to a position where the hammer pin is in the bottom thereof (as shown in FIG. 22).

To refer once more to FIG. 22, same shows the firing cycle completed with the breech bolt closed and the trigger in the forward, ready-to-fire, position.

The sliding action of the end portion 158 of the hammer spring having been thus explained in this description of the conventional sear notch trigger-hammer mechanism, its functioning will not be repeated in the description of the variable contact sear notch trigger-hammer mechanism as shown for a pistol which follows in connection with FIGS. 25–28.

In FIG. 25, the breech bolt 14 is shown in the forward position. The hammer 120, under full tension of the hammer spring 15, is cocked and the gun is in a ready-to-fire position. The hammer pin 164 is at the bottom, or normal position, of the elongated slot 166 in the hammer.

In FIG. 26, the hammer 120 is shown in the down position. The cartridge has just been fired, but the breech bolt has not yet started to recoil.

When pulled, the trigger 168 pivoted on the trigger pin 170 and compressed the trigger spring 172. The sear point 174 of the trigger moved downwardly out of its complemental seat notch in the hammer 120 and the hammer fell, due to the tension of the hammer spring 15. When the hammer struck the firing pin, the cartridge was discharged.

Therefollowing, the breech bolt will start to recoil to the rear against the tension of the recoil spring 16. The hammer pin 164 will remain at the bottom, or normal position, of the elongated pivot slot 166 and the trigger will be held back. The hammer will be cocked by the rearwardly moving breech bolt.

As the hammer is being cocked, the hammer spring ears 184 pivot in the respective openings 189 in the housing and the top portion 158 of the hammer spring exerts an upward, and also a forward, pressure on the hammer keeping the hammer pin 164 bearing on the lower portion of the elongated pivot slot 166 of the hammer.

Just before the hammer reaches full cock, the top portion 158 of the hammer spring begins to exert a downward, as well as a forward, pressure urging the hammer to jump downward along the elongated pivot slot 166.

The sear notch in the hammer 120 contacts the sear point 174 of the trigger 168 in such manner that, as the breech bolt starts to counter recoil, the sear point of the trigger is deeply engaged in the sear notch of the hammer, during which time the trigger is held to the rear.

The hammer pin is now in the top portion of the elongated pivot slot 166, as shown in FIG. 27, with the breech bolt to the rear, and the sear point of the trigger deeply engaged in the sear notch of the hammer. The hump 192 of the trigger contacts the forward rounded surface of the hammer and the trigger is held back.

The breech bolt then moves forward during counter recoil and the sear point of the trigger is deeply engaged in the sear notch of the hammer, as the trigger is held back. See FIG. 28.

The hammer and trigger are in the same relation to each other, as in FIG. 27, except that the sear notch of the hammer now bears on the sear point of the trigger. When the trigger 168 is released, the trigger spring 172 urges the finger portion of the trigger forwardly, and the front portion thereof upwardly. The hump portion 192 of the trigger 168 is in contact with the rounded surface of the hammer 120 so that as the front end of the trigger moves upwardly, it pushes the hammer and the front end of the hammer spring upwardly.

As the hammer moves upwardly, it slides along the hammer pin 164. The trigger 168 pivots on the trigger pin 170 and the sear point 174 of the trigger also moves upwardly.

But as the hump 192 of the trigger 168 is further from the trigger pin (the pivot point of the trigger) than the sear point 174 of the trigger, it moves through a greater arc and therefore pushes upwardly on the hammer (which slides upwardly along the elongated pivot slot) a distance greater than that moved by the sear point.

Although the front end of the trigger and the hammer both move upwardly, the sear point of the trigger moves downwardly on the sear notch of the hammer.

This movement continues until the upward movement of the hammer is stopped by the bottom portion of the hammer pin 164 contacting the bottom of the hammer pivot slot 166.

At this time, the sear point 174 is in shallow engagement with the sear notch of the hammer, as shown in FIG. 25, and a light, crisp, pull is thereby obtained when the trigger is pulled. The crisp pull is obtained when the trigger is pulled and at no other time.

With reference once again to FIG. 25, the reloading cycle has been completed and the gun is again read-to-fire.

As shown in FIG. 26, a safety sear notch 177 may be provided in the hammer so that if the cocked hammer should be jarred off the sear notch of the trigger, when the trigger is not being pulled in the act of firing, the sear point of the trigger will catch in the safety sear notch of the hammer and the face of the hammer prevented from reaching the firing pin.

If a fairly heavy trigger spring is used and the gun is cocked manually, with the finger removed from the trigger, as in loading the first cartridge, the operation of the trigger and hammer is the same, in effect, as if there were no elongated slot. That is, the hammer operates so that the hammer pin is always at the bottom of the elongated pivot slot when the trigger is not held back.

When a relatively light trigger spring is used, and the gun is cocked as above, the hammer, as it approaches full cock, moves downwardly along the elongated slot into the deep notch position so as to force the sear point of the trigger downwardly against the pressure of the trigger spring. As the bolt proceeds to return to battery, it releases the overtravel of the hammer so that the sear point of the trigger contacts the hammer in the deep notch position. When the bolt, in its forward motion, no longer bears on the face of the hammer, the hammer is immediately pushed upwardly along the elongated slot by the force of the trigger spring as it pushes the sear point of the trigger upwardly. When the hammer is in its most upward position (the hammer pin being at the bottom of the elongated slot), the point of the trigger is in shallow notch contact with the hammer and is ready to be pulled to discharge the firearm.

A flat hump 199 is provided on the triggers 168 or 168*a* to act as an over-travel stop for the hammer. As the center of the hump is on the vertical center line of the trigger pivot pin, no movement of the trigger will be felt if the hammer overtravels from the full cocked position sufficiently so that the lower portion of the hammer contacts the hump of the trigger.

The lowermost outwardly extending end coils 173 of the trigger spring 172 are closed in and bent to form a

detent point for the operation of the safety now to be explained.

The left hand detent cut 196 on the shelf 200 of the safety serves to hold the safety in the safe position. The right hand detent cut 198 serves to hold the safety in the fire position. See FIG. 18.

The shelf 200 is disposed under a downwardly projected portion 202 of the lower front end of the trigger. The top portion of the safety 122 is held upwardly, against the downward tension of the trigger spring, by the safety ears 124 bearing on the respective bottoms of the slots 126 in the housing assembly, wherefor the trigger cannot be pulled.

When the safety is moved to the left, the shelf 200 of the safety is disposed under the cut-away portion 208 of the lower front end of the trigger 168 so that the trigger may be pulled.

The cut-away portion 208 of the front end of the trigger 168 bears on the shelf 200 after the trigger has been pulled, and acts as a trigger stop.

When the conventional sear notch (FIGS. 22–24) is used, the stoppage occurs immediately after the trigger point is pulled out of the sear notch of the hammer.

When the variable contact sear notch (FIGS. 25–28 inc.), is used, there is a predetermined amount of overtravel of the trigger, after the trigger point has been pulled out of the sear notch of the hammer, before the stoppage occurs.

One function of a trigger safety is to act as an indicator so as to enable the operator to know if the gun is cocked. When cocked, the sear point of the trigger is engaged in the sear notch of the hammer. In this position, the safety is free to move to the safe position. When pulled out of the sear notch and the gun is fired, the front end of the trigger assumes a more downwardly position. In such position, a portion of the lower front end of the trigger blocks the movement of the safety to the safe position. Unable to move the safety, the operator knows that the gun is not cocked.

Using the conventional notch shown in FIG. 22, the gun is shown as cocked and ready to fire. As with most firearms of this type, the trigger point goes the usual depth into the sear notch of the hammer, resulting in a long, creepy, pull. This necessitates a long pull of the trigger and, because of the long trigger pull, a considerable amount of interference from the downwardly projected portion 202 of the trigger is experienced when and if the safety is attempted to be thrown with the hammer in the down position of FIG. 23.

When the safety is in the fire position and the trigger hammer cocked, the shelf 200 is moved under the downwardly facing forward end portion of the trigger to prevent the trigger from being pulled.

When the safety is in the first position and the trigger has been pulled, the parts assume the position shown in FIG. 23.

As above stated, the trigger pull on the variable contact sear notch (FIGS. 25–28 inc.), can be made short and crisp.

When a very slight trigger movement is required to fire the weapon, the amount of interference which the downwardly projected portion of the trigger presents to the safety after the trigger has been pulled is very slight. I have increased the amount of this interference. A long pull of the trigger moves the lower front end of the trigger a much greater distance downwardly than does a short pull. This causes a much greater amount of interference by the trigger point, if the hammer is in the down position and the safety is attempted to be thrown.

There is necessarily some over travel of the trigger after it has been pulled when the variable contact sear notch mechanism is used. This is taken advantage of in the form of a hump 229 on the bottom of the hammer (shown in FIGS. 25–28 inc.). When the hammer falls the hump 229 keeps the lower front portion of the trigger in the

"over traveled" position. In this position, the hump provides a surface to interfere with the throw of the safety approximately equal to the height of the hump.

Although shown as a hump for convenient reference, it may be in the form of a continuous radius from the sear notch to the top of the hump, as shown in FIG. 1.

The trigger pull on the sear has a certain predetermined amount of over travel as stated above after the hammer has been released. The effects of this over travel may be partially overcome, if desired, by two trigger springs of opposite hands, one disposed inside of the other. The inner spring with a closed in end detent portion, operates in the same manner as the single trigger spring but, just as the hammer is released by the sear, the shelf **200** of the safety is contacted by the shorter and much heavier outer spring not shown which extends just below the cut away lower portion of the trigger. As the trigger is further pulled rearwardly during over travel, the heavier outer spring is also compressed and acts as a trigger buffer.

The hammer and trigger, as shown in FIG. 29, may be made from laminations of sheet steel stampings which are riveted, soldered, welded or brazed together. However, they may be made in any other manner and of any other material, all within the spirit of this invention.

The assembling of the gun will now be described.

The bedding plate **152** with its upper rounded rear end portion **150** extending upwardly and rearwardly is placed within the stock. The assembly screw **203** is pushed upwardly through an appropriate opening in the stock and is threadedly engaged with the bedding plate, until the middle relieved portion of the screw is free within the tapped hole **216** of the bedding plate.

As will subsequently be observed, the bedding plate, in connection with the screw, holds the barrel-receiver assembly, the housing assembly, the magazine catch, the ejector, and the stock, all locked together in a single assembled unit.

The magazine catch **144**, with its rearmost portion **142** extending downwardly and rearwardly is then placed over the screw, **203**, the forwardly extending lip portion **154** of the magazine catch being provided with an opening therethrough of sufficient diameter to clear the threads of the screw **203** as it is placed thereover.

It may be threaded and placed over the assembly screw in a manner similar to the bedding screw, if desired.

The trigger housing is then picked up and the safety **122** is placed therein against the rearward side of the rear magazine wall portion **53**, the safety being allowed to drop downwardly until the ears **124** thereof are seated in the slots **126** in the trigger housing.

The trigger spring **172** is placed in the trigger spring opening in the lower front portion of the trigger, with the detent of the spring extending outwardly. The upper coils may be slightly enlarged so as to insure the retention of the trigger spring in its opening in the trigger. The trigger **168** is placed in position in the housing and the trigger pin **170** is pushed into the trigger pin opening from the left. The ears **184** of the hammer spring **15** are squeezed together and allowed to snap outwardly into corresponding openings **189** in the trigger housing.

Being sure that the safety is in the fire position, the forward end of the hammer spring is placed in the spring slot **162** of the hammer **120** and the upwardly curved end portion is seated in the socket at the forward end of said slot. The hammer may now be pushed into position and the hammer pin **164** assembled in place from the left side. The trigger housing assembly is now complete.

The rear end **98** of the extractor **92** is placed in the extractor opening **100** in the breech bolt and the extractor hook **102** is pulled outwardly while the extractor is pushed into position. When the lug **94** lines up with the opening **96** in the breech bolt, the lug snaps into the opening due to the spring tension of the bend **98** on the end of the extractor. The point **26** of the ejector **24** is placed in the ejector slot **235** in the lower side of the receiver and the rear of the ejector is swung toward the receiver until the upper face of the base portion **23** of the ejector contacts the bottom portion of the receiver **6**.

The ejector slot **235** has a shoulder **233** which functions as a stop to prevent forward movement of the ejector during assembly.

The firing pin **60** is inserted into the breech bolt **14** so that its forward striking point extends through the firing pin opening **70**. When in its most forwardly position, the firing pin retaining lug **82** drops into the firing pin retaining cut **86** of the breech bolt.

The breech bolt is now inserted into the receiver with the left hand magazine clearance cut sliding over the top of the ejector. The rear end of the ejector meanwhile is held against the bottom of the receiver with a finger. The recoil spring **16** is compressed onto the shank **30** of the recoil spring guide. With the breech bolt in the rear position in the receiver, the compressed spring on the recoil spring guide is placed in the recoil spring hole, with the rear end **28** of the guide facing to the rear. The spring is released and the bolt is allowed to move forward while the rear end **28** is retained by a finger. The rear cap **32** is placed over the end of the recoil spring guide and the rear cap is pushed into the receiver until it is stopped by the shoulder on the cap.

The trigger housing assembly is held upright in one hand and the barrel-receiver assembly in the other. The rear cap and the ejector are meanwhile being held in place, by the hand holding the receiver. Holding the barrel-receiver assembly at an angle to the horizontal, with the muzzle upward, the slot **48** in the rear cap is placed on the rear housing extension. The front end of the barrel is then swung downwardly into place. As the rear wall of the magazine well is at an angle corresponding to the front face **237** of the base **23** of the ejector (see FIG. 19), a wedging action takes place.

The combined barrel-receiver and trigger housing assembly are now placed in the stock.

With all components now in place, the assembly screw **203** is threadedly engaged with appropriately aligned openings in the receiver and barrel, as shown.

As the assembly screw is tightened, the receiver-barrel assembly is pulled downwardly and the forward end **214** of the bedding plate contacts the lower portion of the barrel. The bedding plate pivots on the fulcrum **212** of the stock. The upper rounded rear end **150** of the bedding plate pushes upwardly against the bottom of the bend **153** of the magazine catch **144**. The upper bend of the magazine catch in turn pushes upwardly on the bend between the vertically extending and horizontally extending portions **155** and **156** respectively of the front wall of the trigger housing.

Simultaneously, the barrel-receiver assembly and the bedding plate, being forced upwardly at the front, pivots on the stock fulcrum and forces the rear end of the receiver downwardly against the angles of the housing ears. See FIG. 4.

Continued pressure, as the assembly screw is tightened, forces the housing ears firmly against the ear bedding surfaces **204** of the stock upon which the bedding ears of the trigger housing rest. See FIG. 4.

The complete assembly is now locked in the stock, the assembly screw exerting downward pressure, the bedding plate bearing on the fulcrum of the stock and the housing ears bearing on the ear bedding surface of the stock. The lower front end of the receiver bears on the front housing extension **156** of the housing **50** and the lower rear of the receiver bears on the angle of the housing ears **222**. See FIG. 4.

The trigger housing and barrel-receiver assembly are locked together against relative longitudinal movement by the housing extension **51** bearing on the rear cap and the upper end of the rear magazine wall bearing on the lower front end **237** of the ejector, the rear end of which in turn bears against the rear of the ejector slot

235. As the housing is pushed upwardly, the angle of the rear magazine wall bears on the angle of the lower front end of the ejector and a wedging action takes place, locking the components firmly together.

Said uppermost end 53' is receivable in the magazine cut 239 in the receiver. See FIG. 7. As the housing assembly is pushed upwardly, the angle of the rear magazine wall bears on the angle at the lower front end of the ejector so as to provide a wedging action locking the components firmly together.

Any rearward movement of the ejector is prevented by the lower rear end of the upwardly projected guide portion 24 bearing on the rear end of the ejector slot 235 in the bottom of the receiver.

The underside of the base portion 23 of the ejector 22 is locked solidly in place between the bottom of the receiver 6, which bears on the top portion of the base of the ejector, and the ejector support portion 116 of the trigger housing, upon which the ejector rests, when the assembly screw is tightened.

The barrel is now free floating in the stock and the rear portion of the trigger housing assembly bears on the recoil shoulder 206 of the stock 4.

On the rifle, the assembly screw 203 may be threadedly engaged with the lower rear portion of the barrel, as shown in FIG. 2. In this instance, the bedding plate 152*a* is preferably of greater width and length so as to provide increased strength.

In the case of the rifle, the bolt handle 17*a* is now placed in the bolt handle slot 242*a* of the breech bolt 14*a* by holding the bolt handle at an angle and pressing the lug 244*a* forwardly into the front undercut 246*a* of the slot 242*a*. The bolt handle retaining spring hump 248*a* of the bolt handle retaining spring 250*a*, which is made of spring wire, is pressed downwardly and into the slot 252*a* of the bolt handle which forces the catch portion 254*a* forwardly enabling the rear of the bolt handle to be pushed downwardly into the slot. When the bolt handle is fully seated in the slot, the catch portion 254*a* snaps rearwardly into the rear undercut 256*a* of the slot, retaining the handle in place. To remove, the hump 248*a* is pressed downwardly, retracting the catch portion and enabling the rear end of the handle to be pulled upwardly and rearwardly out of the slot.

The arm 256*a* of the bolt handle retaining spring 250*a* has a slight bend to retain it in the retaining spring hole 258*a* in the bolt handle.

As a modified form of bolt handle for the rifle, a spring type bolt handle 260*a* is shown in FIG. 39. Same is formed from flat spring stock that is the same width as slot 242*a* in the breech bolt 14*a* and may be placed in said slot in lieu of the solid bolt handle 17*a*.

FIG. 40 shows the spring type bolt handle being assembled in place. The front tab 262*a* is placed in the front under cut of the slot 242*a* and the curved end 264*a* of the locking arm 266*a* is pulled upward and the rear leg 268*a* is pressed forward until the rear tab 270*a* can be pushed downward into the slot 242*a* at which time the leg 268*a* is released and the rear tab snaps into the rear under cut of the slot, due to its inherent spring pressure. The locking arm then springs downward and the rear of the curved end 264*a* bears against the forward lower portion of the rear leg 268*a* blocking its forward movement and securely locking the spring type bolt handle in the bolt 14*a*, as shown in FIG. 41.

To remove the spring type bolt handle from the bolt, the top portion of the curved end 264*a* is grasped and pulled upward. When in the upper position, the lower rear of the rear leg 268*a* is pushed forward enabling the rear tab 270*a* to clear the rear under cut at which time the rear leg can then be lifted upward and when clear of the slot allowed to snap rearward. The front tab 262*a* can then be pulled rearward and the spring type bolt handle removed from the bolt.

Although in the drawings and in the above description I have shown two optional but preferred embodiments of my invention and various alternatives and modifications thereof, it is understood that these are not intended to be exhaustive of nor limiting of nor departing from the spirit of the invention. That is to say, the objects of the invention may be attained by use of constructions different in certain respects from that disclosed such as in size, form, proportion and the like without departing from the underlying principles of the invention and it is understood that such will readily occur to those skilled in the art. The invention is susceptible of same, without departing from the real spirit or scope hereof. Such adaptations and/or changes should be and are intended to be comprehended within the meaning range of equivalence of the claim appended below.

Without further analysis, the foregoing is intended to so fully reveal the gist of my invention and the construction and operation of the device thereof that others can, by applying current knowledge, readily adapt it for various applications without omitting features which, from the standpoint of prior art, fairly constitute essential characteristics of the generic or specific aspects of this invention. Therefore, such adaptations should and are intended to be comprehended within the meaning range of equivalence of the claim below.

The following claim is desired to include within the scope of the invention all such suitable variations, modifications and equivalents by which substantially the results of the invention may be obtained through the use of substantially the same or equivalent devices or means.

Accordingly, limitation of this invention should be made only as determined by a proper interpretation of the terms used in the subjoined claim.

Having thus described the invention, what is claimed as new and novel and is desired to be secured by Letters Patent, is:

In a semi-automatic type firearm without separate sear or disconnecting mechanism, the improvement in a trigger-hammer subassembly comprising, a trigger housing, a spring-biased hammer pivotally mounted on said trigger housing and movable between battery and recoil positions by means of a transversely-extending hammer pin receivable through an elongated pivot slot in said hammer, said hammer being slotted with an elongated recess having spaced upper and lower end walls and an intermediate wall connecting therebetween, a hammer spring supported by said trigger housing and having a free extremity extendable into the recess of said hammer for releasably holding said hammer in a cocked position between the retracted and firing positions and being shiftable between a favorable cocking leverage position adjacent the upper end wall of the recess with said hammer in a cocked position and unfavorable cocking leverage position adjacent the lower end wall of the recess with said hammer in a fired position, a trigger pendulantly mounted on said trigger housing for manually actuating said hammer to fired position, a trigger spring serving as a trigger spring and safety retainer and safety detent, said trigger having a sear point, said hammer having a variable contact sear notch complemental to the sear point of said trigger, the sear point of said trigger being adapted for normally deep-seated contact in the variable contact sear notch of said hammer for restraining said hammer in cocked position and being adapted for sliding to relatively shallow contact in the variable contact sear notch of said hammer during a certain rotational movement of said trigger preparatory to releasing said hammer from cocked position for effecting a short and light discharge pull upon discharge, with said hammer spring simultaneously exerting an upward-forward pressure on said hammer during hammer-cocking for effectuating shifting of said hammer from a position with the lower portion of said hammer pin nesting in the lower portion of the pivot slot in said hammer to a position with said hammer pin nesting in the upper portion of the pivot slot in said hammer, said trig-

ger being provided with a hump engageable with said hammer for urging said hammer and hammer spring upwardly and said hammer being provided with a surface engageable with the hump of said trigger, the variation in notch depth contact being accomplished by the elongated pivot slot in said hammer in cooperation with the face of said hammer contacting a hump on the face of said trigger forwardly of the sear point after said hammer is cocked and said trigger is released forwardly.

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