

May 30, 1944.

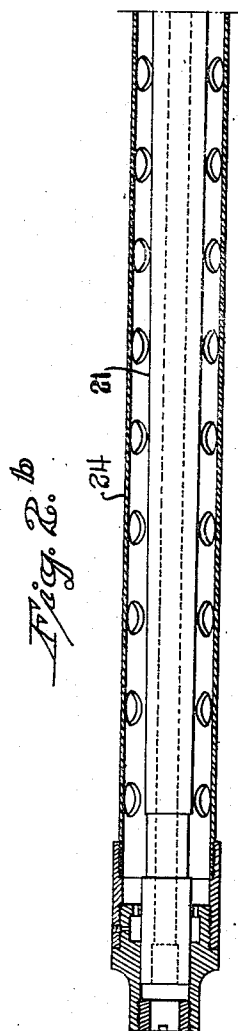
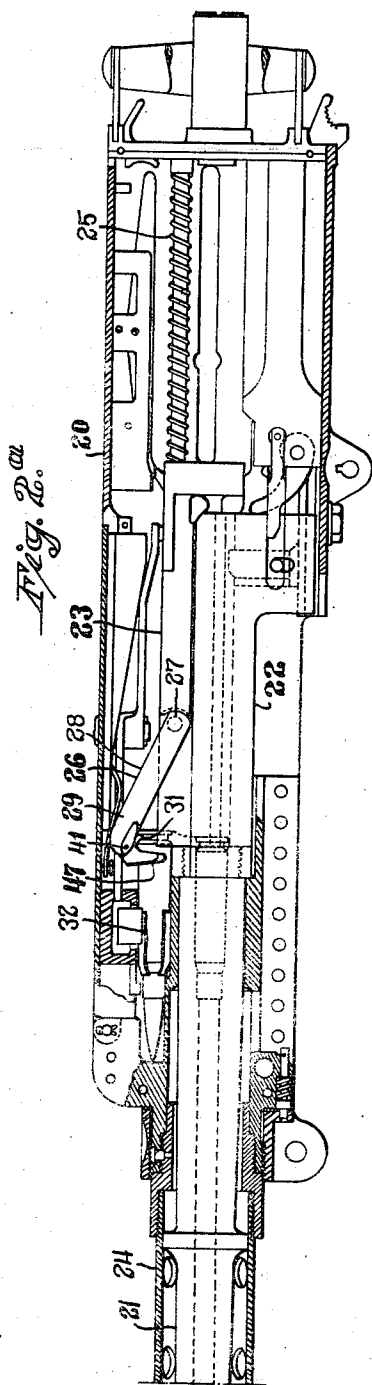
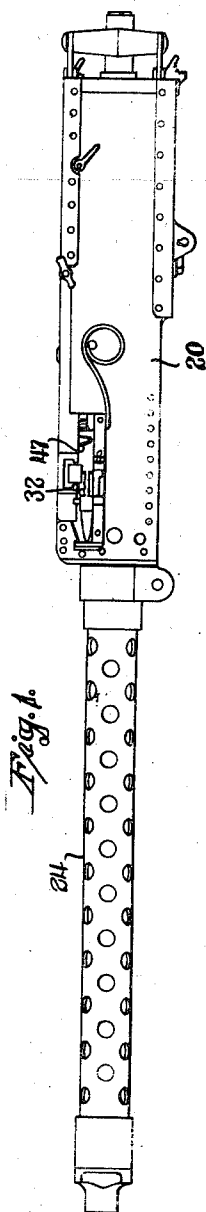
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2,350,131

PIVOT-MEANS FOR FIREARM ELEMENTS

Filed Aug. 27, 1943

2 Sheets-Sheet 1



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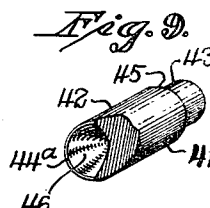
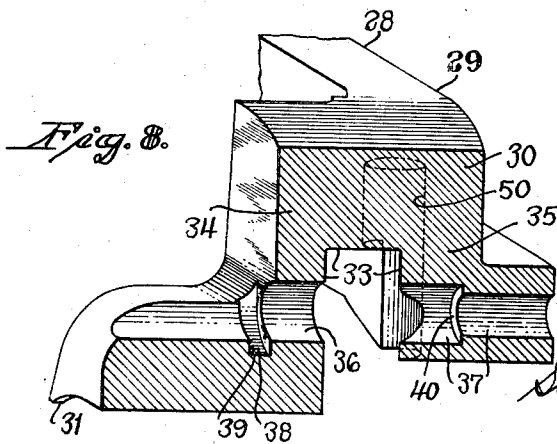
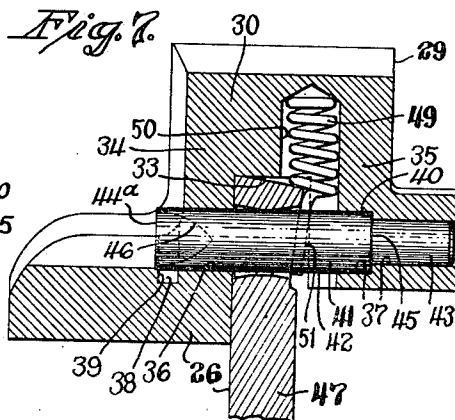
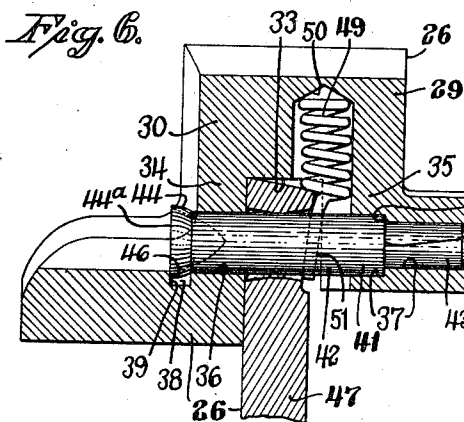
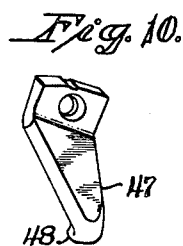
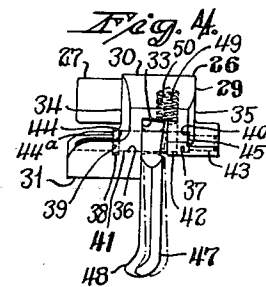
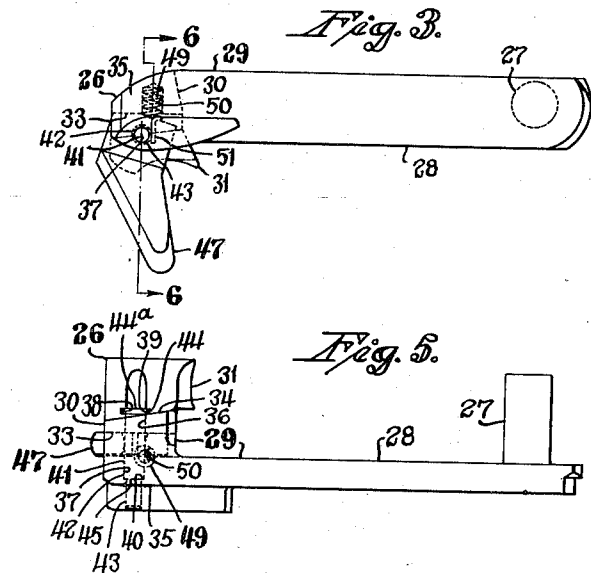
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PIVOT-MEANS FOR FIREARM ELEMENTS

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2 Sheets-Sheet 2



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PIVOT MEANS FOR FIREARM ELEMENTS

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3 Claims. (Cl. 287—1)

The present invention relates to improvements in pivot-means for firearm elements, i. e., pivot-means whereby ejectors, triggers, sears and other swinging members of a firearm may be pivotally connected to another member or feature of the firearm-structure.

One of the main objects of the present invention is to provide superior pivot-means for firearms in which is included a pivot-pin or its equivalent and in which the parts are so constructed and arranged that the stresses imposed upon such a pivot-pin in guarding it against axial displacement, are in the nature of axially-applied compressive stresses, rather than tensional stresses.

Another object of the present invention is to provide superior pivot-means for firearm-structures in which is included a pivot-pin or its equivalent and in which provision is made whereby, in the event of the pivot-pin being broken into two parts by a transverse fracture, the parts of the said pivot-pin will be effectively prevented from harmful axial separation.

A further object of the present invention is to provide superior pivot-means for firearm elements which will combine both of the general advantages above referred to in a structure which may be produced at a low cost for manufacture.

With the above and other objects in view, as will appear to those skilled in the art from the present disclosure, this invention includes all features in the said disclosure which are novel over the prior art.

In the accompanying drawings, in which certain modes of carrying out the present invention are shown for illustrative purposes:

Fig. 1 is a view in side elevation of a machine gun equipped with the present invention;

Fig. 2a is a broken view partly in side elevation and partly in vertical central-longitudinal section of the rear portion of the machine gun shown in Fig. 1 with the parts shown in the positions which they assume when the breech-bolt is in its normal breech-closing position;

Fig. 2b is a similar view of the forward portion of the machine gun;

Fig. 3 is a view in side elevation of the extractor-and-ejector unit, detached;

Fig. 4 is a view thereof in front-end elevation;

Fig. 5 is a top or plan view thereof;

Fig. 6 is a transverse sectional view taken on the line 6—6 of Fig. 3 but on a larger scale;

Fig. 7 is a view corresponding to Fig. 6 but showing the pivot-pin prior to the same having its end expanded to form the lip-like stop-abutment;

Fig. 8 is a broken sectional perspective view of the outer end-portion of the extractor stripped of the pivot-pin, ejector and ejector-spring;

Fig. 9 is a perspective view partly in section of the pivot-pin prior to having its stop-abutment expanded; and

Fig. 10 is a perspective view of the ejector.

The particular machine gun herein chosen for purposes of illustrating one form of the present invention, is of the so-called "Browning" type and is of the general character illustrated in more detail in United States Patent No. 1,628,226, dated May 10, 1927.

Inasmuch as the present invention relates to pivot-means for the firearm elements, only a brief description will be made of the major features of the particular machine gun in which the present invention is incorporated for purposes of illustration.

The machine gun illustrated in the accompanying drawings includes a receiver generally designated by the reference character 20, an axially-reciprocating barrel 21, a barrel-extension 22, a breech-bolt 23 and a barrel-jacket 24.

The barrel 21 has its rear portion extended within the receiver 20 for reciprocation therein and the aforesaid barrel-extension is organized with the rear-end of the barrel for reciprocation also within the receiver 20, in a manner well known in the art.

The breech-bolt 23 reciprocates both with and with respect to the barrel-extension 22 in a manner well known in the art, and is yieldingly urged forwardly into its breech-closing position by a helical breech-closing spring 25. Pivotally mounted to one side of the breech-bolt 23 is an extractor-and-ejector unit generally designated by the reference character 26. The pivotal mounting of the unit 26 is effected by means of a stud 27 rigidly offsetting laterally from the inner face of the rear portion of the bar-like arm 28 of a cartridge-extracting member 29. At its forward end the cartridge-extracting member 29 includes a head 30, preferably forged or otherwise made integral with the bar-like arm 28. At its rear lower corner adjacent its outer end the head 30 of the cartridge-extracting member 29 is formed with a cartridge-extracting hook 31 adapted in a manner well known in the art to successively fit into the respective cannellures of a series of cartridges to effect the successive individual extractions thereof from a cartridge-belt 32 indicated in Figs. 1 and 2a.

Immediately adjacent the inner face of the arm 28, the head 30 of the member 29 is formed with a longitudinally-extending notch or gap 33

formed on the underside of the said head and opening downwardly as well as to the front and rear thereof. The notch 33 as thus formed creates a gap between what might be aptly described as two wall-portions respectively designated 34 and 35. The wall-portion 34 is formed with a pin-receiving passage 36 which is axially in line with a complementary pin-receiving passage 37 formed in the wall-portion 35. Both of the passages 36 and 37 just referred to stand substantially perpendicularly with respect to the plane of the bar-like arm 28 of the cartridge-extracting member 29 and hence extend substantially perpendicularly with respect to the longitudinal axis of the machine-gun structure.

Immediately adjacent the outer end of the pin-receiving passage 36 in the wall-portion 34, the said wall-portion is formed with an upwardly-opening substantially-semicircular groove 38, the outer wall of which constitutes a stop-abutment 39 which faces inwardly toward the notch or gap 33. The complementary pin-receiving passage 37 in the wall-portion 35 has two diameters as shown and at the junction of its two said diameters it provides an annular stop-abutment 40 facing inwardly toward the notch or gap 33 and hence toward and in opposition to the complementary stop-abutment 39 adjacent the pin-receiving passage 36.

Extending across the notch or gap 33 in the head 30 of the cartridge-extracting member 29 and fitting at its respective opposite ends into the pin-receiving passages 36 and 37, is a pivot-pin generally designated by the reference character 41. The said pivot-pin 41 includes a cylindrical body-portion 42 of relatively-large diameter, a cylindrically-contoured stem 43 at one end, and a flaring head 44 formed at the end of the pivot-pin opposite its said stem 43. The stem 43 of the pivot-pin 41 is of a lesser diameter than the integral body-portion 42 thereof and the said relationship results in the formation on the said pivot-pin of an annular stop-abutment 45. The said stop-abutment 45 faces outwardly away from the notch or gap 33 and is normally seated against the inwardly-facing stop-abutment 40 in the pin-receiving passage 37.

The head 44 of the pivot-pin 41 has its outer end or edge also facing outwardly away from the notch or gap 33 to provide an annular lip-like stop-abutment 44a which is normally engaged with the stop-abutment 39 which faces inwardly as before described. The head 44 is preferably produced by providing the adjacent end of the pivot-pin 41 with a cavity 46 from which the metal may be flared outwardly to form the said head 44.

Extending upwardly into the notch or gap 33 in the head 30 of the cartridge-extracting member 29 is the apertured upper end of a cartridge-ejecting-member 47. The body-portion 42 of the pivot-pin 41 extends through the apertured upper end of the said member 47 and serves to organize the said member with the cartridge-extracting member 29 to constitute, together with other associated parts, the extractor-and-ejector unit 26 before referred to and especially well shown in Figs. 3, 4, and 5. At its lower end the cartridge-ejecting member 47 is curved inwardly toward the breech-bolt 23 to provide a finger 48, the upper surface of which serves under some conditions to retain a cartridge against downward movement and in other instances the under face of the said finger serves to downwardly eject a cartridge.

For the purpose of yieldingly maintaining the cartridge-ejecting member 47 in the position in which it is shown by full lines in Fig. 4 and to permit it to yield into the position in which it is shown by broken lines in the same figure, a helical ejector-spring 49 is employed. The said ejector-spring is located mainly in a downwardly-opening spring-pocket 50 formed in the head 30 of the cartridge-extracting member 29 and intersecting at its lower portion the notch or gap 33. The said ejector-spring 49 is formed at its lower end with a depending-tail 51 normally pressing against the upper portion of the outer face of the cartridge-ejecting member 47. The downward thrust of the ejector-spring 49 is mainly on the top of the cartridge-ejecting member 47 adjacent the outer face thereof, so that the tendency of the said spring is to yieldingly maintain the said member in the position in which it is shown by full lines in Figs. 4, 6 and 7, while permitting the said ejector to be swung into the position in which it is indicated by broken lines in Fig. 4.

In assembling the extractor-and-ejector unit 26, the ejector-spring 49 is positioned as shown in Fig. 7, as is also the cartridge-ejecting member 47. The pivot-pin 41 with its head 44 still unexpanded, is slid into the two complementary pin-receiving passages 36 and 37 and through the apertured upper end of the cartridge-ejecting member 47 until the said parts assume substantially the positions in which they are shown in Fig. 7. Now by means of a suitable tool which may be inserted into the cavity 46, the adjacent end of the pivot-pin 41 may be expanded to form the head 44 (Fig. 6) to thereby force a portion of the said head into the groove 38 of the head 30 and engage a portion of the resultant lip-like stop-abutment 44a into engagement with the inwardly-facing stop-abutment 39.

The body-portion 42 of the pivot-pin 41 as thus mounted, is prevented from axial displacement by the engagement of its complementary outwardly-facing stop-abutments 44a and 45 respectively with the inwardly-facing stop-abutments 39 and 40 in the head 30 of the member 29. Thus, any effort to axially displace the pivot-pin 41 subjects the same to a compressive strain, rather than to a tension strain. In the event that the pivot-pin 41 should become transversely cracked or broken, the two resulting parts will be still held in place and the said parts will not be able to work their way axially outward to jam or otherwise damage the machine-gun mechanism.

The invention may be carried out in other specific ways than those herein set forth without departing from the spirit and essential characteristics of the invention, and the present embodiments are, therefore, to be considered in all respects as illustrative and not restrictive, and all changes coming within the meaning and equivalency range of the appended claims are intended to be embraced therein.

I claim:

1. Pivot-means for firearm elements, including in combination: a first firearm-member having two complementary laterally-spaced-apart wall-portions having a gap therebetween for the reception of a second firearm-member, each of the said wall-portions having a pin-receiving passage extending substantially coaxially with respect to the similar passage in the other wall-portion, each of the said pin-receiving passages

intersecting at its inner end the gap between the said wall-portions, each of the said wall-portions having one of two stop-abutments adjacent an outward portion of its pin-receiving passage and facing inwardly toward the gap between the said wall-portions and in opposition to the stop-abutment in the complementary wall-portions; a second firearm-member having a portion extending into the gap between the two complementary wall-portions of the said first firearm-member and having an aperture therethrough registering with the respective passages in the said complementary wall-portions; and a pivot-pin extending in the two said pin-receiving passages and through the said aperture, the said pivot-pin having two integral complementary stop-abutments facing outwardly away from each other and respectively positioned to engage with the respective inwardly-facing stop-abutments respectively formed in the two said complementary wall-portions of the said first firearm-member.

2. Pivot-means for firearm elements, including in combination: a first firearm-member having two complementary laterally-spaced-apart wall-portions having a gap therebetween for the reception of a second firearm-member, each of the said wall-portions having a pin-receiving passage extending substantially coaxially with respect to the similar passage in the other wall-portion, each of the said pin-receiving passages intersecting at its inner end the gap between the said wall-portions, each of the said wall-portions having one of two stop-abutments adjacent an outward portion of its pin-receiving passage and facing inwardly toward the gap between the said wall-portions and in opposition to the stop-abutment in the complementary wall-portions; a second firearm-member having a portion extending into the gap between the two complementary wall-portions of the said first firearm-member and having an aperture therethrough registering with the respective passages in the said complementary wall-portions; and a pivot-pin extending in the two said pin-receiving passages and through the said aperture, the said pivot-pin having two in-

tegral complementary stop-abutments facing outwardly away from each other and respectively positioned to engage with the respective inwardly-facing stop-abutments respectively formed in the two said complementary wall-portions of the said first firearm-member, one of the said stop-abutments of the pivot-pin being in the form of an outwardly-bent integral stop-lip.

3. Pivot-means for firearm elements, including in combination: a first firearm-member having two complementary laterally-spaced-apart wall-portions having a gap therebetween for the reception of a second firearm-member, each of the said wall-portions having a pin-receiving passage extending substantially coaxially with respect to the similar passage in the other wall-portion, each of the said pin-receiving passages intersecting at its inner end the gap between the said wall-portions, each of the said wall-portions having one of two stop-abutments adjacent an outward portion of its pin-receiving passage and facing inwardly toward the gap between the said wall-portions and in opposition to the stop-abutment in the complementary wall-portions; a second firearm-member having a portion extending into the gap between the two complementary wall-portions of the said first firearm-member and having an aperture therethrough registering with the respective passages in the said complementary wall-portions; and a pivot-pin extending in the two said pin-receiving passages and through the said aperture, the said pivot-pin having a stem at one end of a diameter smaller than the body-portion of the pivot-pin, the said pivot-pin being formed at the junction of its body-portion and the said stem with an outwardly-facing stop-abutment positioned to engage with the adjacent one of the two inwardly-facing stop-abutments formed in the said first firearm-member, the said pivot-pin also having at its end opposite its said stem an outwardly-bent stop-lip having its outer end engaged with the other of the two stop-abutments of the said first firearm-member.

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