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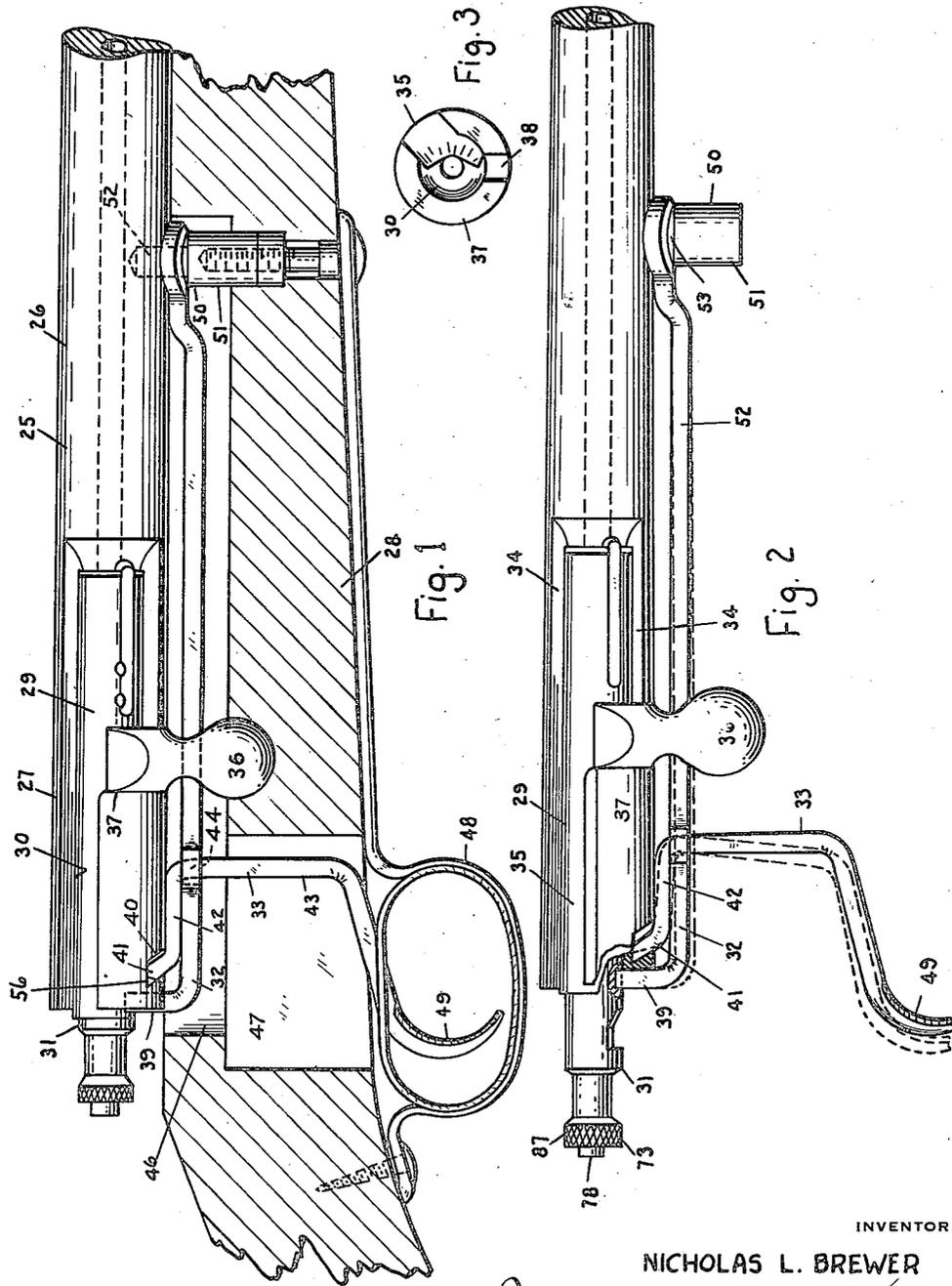
N. L. BREWER

2,173,576

REBOUNDED STRIKER CONSTRUCTION FOR FIREARMS

Original Filed Nov. 8, 1937

2 Sheets-Sheet 1



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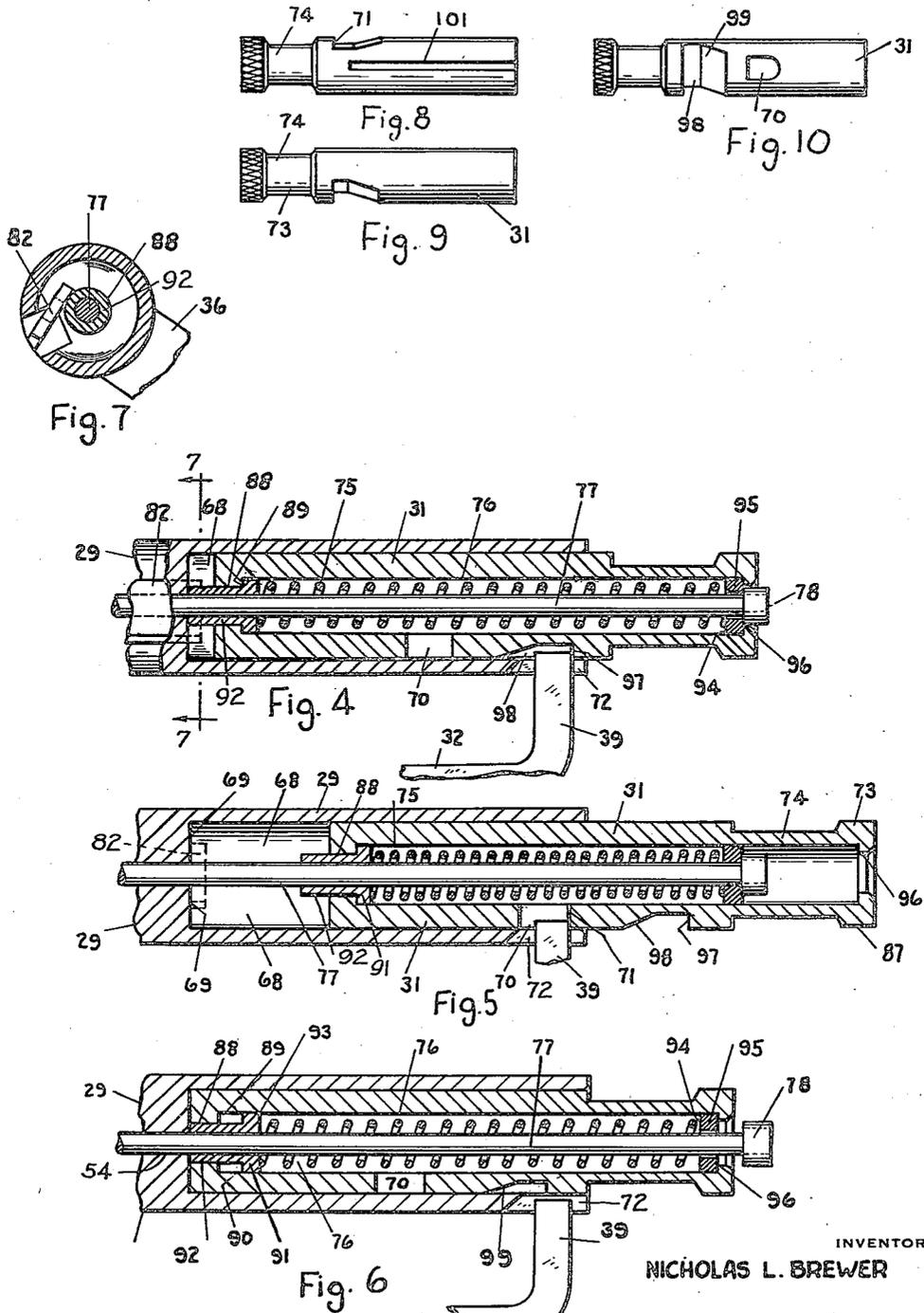
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UNITED STATES PATENT OFFICE

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REBOUNDED STRIKER CONSTRUCTION FOR FIREARMS

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Original application November 8, 1937, Serial No.
173,358. Divided and this application July 23,
1938; Serial No. 220,921

4 Claims. (Cl. 42-19)

This application is a division of an application filed by me November 8, 1937 in the United States Patent Office as Serial No. 173,358.

This invention relates to rifles and more especially to the rebounding striker or hammer construction therein that will be used more particularly with single shot, handcocked rifles of the bolt action type.

The general purpose of my present invention is to provide a new and improved form of rifle and especially to provide a new and improved form of rebounding striker or hammer construction wherein one spring serves as both the main spring and the rebound spring, and to provide new and improved construction and combination of the parts of said construction tending to compactness of parts and efficiency in operation.

Further purposes and advantages of the invention will appear from the specification and claims herein.

Fig. 1 is a right-hand side elevation of the material portion of a bolt action rifle illustrating my present invention, the adjacent part of the stock being in vertical section, the parts being in the position they occupy when the breech member is closed but the rifle not cocked.

Fig. 2 is a side view of the parts shown in Fig. 1, omitting the stock, but with the breech member closed and with the rifle cocked.

Fig. 3 is a rear end elevation of the combination barrel and receiver.

Fig. 4 is a vertical sectional view on an enlarged scale of the striker and its contained parts and of the rear half of the breech bolt and showing in side elevation a part of the firing pin near its rear end and the rear end of the sear, the parts being in the position they occupy when the striker is in rebounded or neutral position and when the said parts are seen from the left-hand side of the rifle.

Fig. 5 is a view similar to Fig. 4 but with the parts in the position they occupy when the rifle is cocked.

Fig. 6 is a view similar to Fig. 4 but with the parts in the position they occupy when the rifle has been fired but prior to the rebound of the striker.

Fig. 7 is a cross-sectional view on line 7-7 of Fig. 4 and showing the rear end of the firing pin and so its relative angular position in the chamber of the breech bolt directly in line with the striker 31.

Figs. 8, 9 and 10 are respectively top or plan, right side elevation and bottom views of the

striker when the breech block is in locked position.

Referring to the drawings in a more particular description it will be seen that the rifle illustrated is of the bolt action, single shot, hand-loaded and hand-cocked type and includes one member 25 being a combined or integrally formed barrel 26 and receiver 27 mounted above the stock 28, a breech bolt 29 reciprocatingly mounted in the chamber 30 of the receiver with said breech bolt in turn having mounted therein a striker 31 normally controlled by the sear 32 and trigger 33.

The chamber 30 extends for the whole length of the receiver 27 to slidably receive therein the generally cylindrically-shaped breech bolt 29. From this chamber there projects to the right and for nearly one-third of the circle of the receiver the loading and ejecting aperture 34 and from the upper part of this aperture there is a narrower straight rearwardly extending passage 35 for the movement therethrough of the inner end of the breech bolt handle 36. At the rear end of the lower half of the loading aperture 34 the receiver provides a forwardly facing shoulder 37 against which the rear face of the inner end of the bolt handle engages when the breech bolt had been slid to forward position and then partly rotated to lock the same in forward position by downward movement of the said handle as is shown best in Figs. 1 and 2.

As appears from Fig. 3 which is a rear view of the receiver and barrel, the rearward end of the receiver at its lower part is provided with a guiding cut 38 wide enough and long enough to slidably receive therein the upper end of the upstanding finger 39 on the sear 32.

Transversely extending through the lower portion of the receiver slightly forward from its rear end and slightly spaced from the guiding cut 38 there is provided an angularly disposed slot 40 which slopes forward as it extends downwardly and is adapted to loosely receive the correspondingly slanted upward projection 41 at the upper and rear end of the trigger 33.

Immediately forward of the slanting projection 41 on the trigger, the trigger is provided with a forwardly extending straight portion 42 which normally lies parallel to the adjacent lower surface of the receiver. Thereafter the trigger has a central straight portion 43, the upper portion of which extends through the aperture in the sear 32. As appears from Fig. 1, this central portion 43 of the trigger extends downwardly at right angles to the receiver and through the recess 46 in the stock provided to house the re-

ceiver and the sear and trigger and also through the secondary recess 47 extending entirely down through the stock for the passage therethrough of the trigger. Below this secondary recess 47 there is provided the ordinary trigger guard 48 into the opening of which the lower part 49 of the trigger extends for manual operation thereof in the usual way.

As is best shown in Fig. 1 the sear 32 is a combined sear and sear spring being formed of a relatively long bar of spring metal provided at its rearward end with the upstanding finger 39 already mentioned and provided a short distance forward thereof with the aperture through which the trigger passes. Adjacent the aperture the sear is enlarged laterally and forward of this enlarged portion the sear extends forward still spaced from the lower side of the receiver and of the barrel almost to its forward end which is offset upwardly and curved to fit the rounding face of the adjacent portion of the barrel. This combined sear and sear spring is secured to the barrel by the take-down lug 50, the lower part 51 of which is enlarged relative to its upper screw-threaded portion 52 so that an upwardly facing shoulder 53 is provided bearing against the lower part of the front end of the sear. The arrangement and construction is such as to give a constant upward tension to the rear end of the sear and thus hold the trigger in normal position as shown in full lines in Fig. 1, but allowing a rearward pull upon the finger portion of the trigger to depress the sear to the position shown in dotted lines in Fig. 2 at which position the upper portion of the finger on the sear has become disengaged from the striker 31. It will be obvious that the proper rearward pressure upon the lower or finger portion of the trigger will bodily swing the trigger. During such swinging operation, the upper projection 41 on the trigger will act as a sliding fulcrum for the trigger, and the lower surface of the forward part of the straight upper portion 42 of the trigger will bear against the upper face of the sear at the rear of the aperture 44 and so swing the rear end of the sear downwardly. As soon as the sear is released from the striker the striker will shoot forward under the action of the combined main spring and rebound spring 75 and effect a firing impulse upon the firing pin 82 as hereinafter described. As soon as the pressure of the shooter's finger is released from the trigger, the sear under its normal tension will return to normal position carrying therewith the trigger to its normal position. The material of the receiver adjacent the rear side of the slot 40 will be upset or punched upwardly on both sides of the trigger finger 41 as at 56 and thus operate to hold the trigger from any possibility of lateral displacement from the slot 40.

The breech bolt 29 is circular in cross section and cylindrical in outline. The forward end in the main is solid but its rear half is tubular in form providing a chamber 68 open at its rear end and bounded at its forward end by a transverse wall 69 where the solid forward half of the breech bolt begins. In this chamber 68 is slidingly mounted the striker 31. In this rifle the striker is cocked by hand, that is the striker is drawn back manually by the shooter grasping the rear portion of the striker that projects beyond the rear end of the breech bolt as seen at the left of Fig. 1 and as seen at the right hand end of Fig. 4. This rear end or tail of the striker also projects beyond the rear end of the receiver

when the breech bolt is in closed position but not cocked as appears in Fig. 1. After the striker has been moved back to cocked position shown in Fig. 5, it is automatically retained and held in that position by the finger 39 on the sear 32 at once springing up into an opening 70 in the bottom wall of the hollow striker where the rear side of the finger of the sear engages the shoulder 71 at the back of said opening 70 in the striker. The arrangement of the parts at this cocked position is well shown in Fig. 5 and also in Fig. 2 where the rear end of the receiver and also the rear lower end of the chambered part of the breech bolt and also a small part of the chambered portion of the striker are cut away on purpose to show the finger of the sear extending through the guiding cut 38 in the rear end of the receiver and through the clearance cut 72 in the rear lower portion of the wall of the breech bolt adjacent its rear end and into the opening 70 in the bottom wall of the striker.

The drawing back of the striker by the shooter pulling upon the tail of the striker compresses the coiled spring 75 mounted within the central bore 76 of the striker and encircling a considerable part of the shank of the striker retaining bolt 77. The head 78 of this bolt is to the rear of the action while its forward end extends into a centrally-located longitudinally extending hole 54 provided in the forward solid half of the breech bolt. For a short distance back from its forward end this striker-retaining bolt 77 is screw-threaded to fit the screw-threaded portion of the said hole 54.

In this rifle I have provided a mechanism wherein the striker 31 is of the rebounding type and wherein one spring namely coiled spring 75 performs the functions both of a main spring and a rebound spring. Details of this mechanism, especially the relative position of the different parts of the mechanism, are best shown in the enlarged sectional views, Figs. 4, 5 and 6.

As already mentioned the rearward half of the breech bolt 29 is provided with a chamber 68 open at its rear end and closed at its forward end by the wall 69. The striker-retaining bolt 77 has the rearward portion of its shank extending longitudinally through the longitudinal axis of the chamber 68 and its forward end passes into a centrally located hole 54 extending some distance forward of the wall 69 in the solid part of the breech bolt and is fixed in position therein by the screw-threaded engagement of the forward end of said striker-retaining bolt with the rearward screw-threaded end of said hole in the breech bolt. The body of the striker 31 is generally cylindrical in form and at the rear is provided with the tail portion 73 which consists of the reduced diameter portion 74 and to the rear thereof the enlarged ring-like portion or cocking knob 87 preferably knurled at its periphery. The reduced size of the part 74 together with the enlarged ring-like and knurled portion 87 afford a good gripping surface to be grasped by the shooter's thumb and finger when the striker is to be pulled back against the tension of the spring 75 for cocking the rifle. The main bore 76 of the striker is circular in cross section and extends for its full diameter for almost the full length of the striker. At its forward end, however, there is a smaller passage 88 providing in the material of the striker at the rear end of said passage 88 a strong annular shoulder 89 against which fits the forwardly facing annular shoulder 90 at the forward face of the enlarged annular flange 91 of the

forward collar 92 which has a central aperture therein by means of which the collar is slidingly mounted upon the striker-retaining bolt 77. The enlarged rearward flange portion 91 of this collar slidingly fits the main bore 76 of the striker and the reduced diameter of the main and forward portion of said collar fits slidingly in the small forward passage 83 of the striker. The striker or main spring 75 is mounted within the main bore 76 of the striker and is coiled about the striker-retaining bolt 77 and its forward end bears against the rear face 93 of the forward collar 92. The rear end of the said spring 75 bears against or is engaged by the forward face 94 of the rearward collar 95 which is slidingly mounted within the striker bore 76 and upon the shank of the retaining bolt 77. This rearward collar 95 is in turn held in place within the bore of the striker by the rearward end of the striker having a constricted opening conveniently formed by the metal at the rear end of the striker being suitably pressed inwardly forming an annular ring 96 of sufficient extent to confine the rearward collar 95 to the bore of the striker. The opening in this ridge 96, however, is of sufficient diameter to let the head 78 of the striker-retaining bolt 77 pass therethrough into the main bore of the striker where at certain positions of the mechanism the forward face of said head 78 engages the rearward face of the rearward collar 95 and thereby operates to let said rearward collar 95 be a support fixed against any further rearward movement by said rear end of the spring 75 when the striker is moved bodily rearwardly as during the cocking operation of the rifle.

Fig. 4 shows the striker and other co-operating parts in the location they occupy when the striker is at neutral or re-bounded position; that is, after the rifle has been fired or snapped and the striker has gone back to re-bounded position and the rifle reloaded, closed and locked. In this position the tail or thumb-piece of the striker and a small part of the body of the striker immediately ahead of the tail projects rearwardly from the chamber 68 of the breech bolt. The forward end of the forward collar 92 is at its most forward position; that is, with its front end engaging the front wall 69 of the bore of the breech bolt. The rearward collar 95 is at its most rearward position relative to the striker and its rear face engages the forward side of the ridge 96 at the back of the striker and also engages the forward face of the head 78 of the striker-retaining bolt 77. The coiled spring 75 extends for its maximum working length between the rear face of the enlarged flange 91 of the forward collar 92 and the forward face 94 of the rearward collar 95 and the spring at this position is under partial minimum working compression. At this position the upstanding finger 39 on the sear 32 has sprung upwardly ready to engage at its rearward side the forwardly facing shoulder 97 formed by a recess or safety or rebound notch 98 in the lower portion of the wall of the striker some distance forwardly of the tail of the striker. This recess 98 extends to a uniform depth around an appreciable part, say about one-third of the circumference of the striker as seen in different positions in Figs. 8, 9 and 10. Forward of this uniform depth portion the wall of said recess slants outwardly forming a slanting or cam surface 99 which operates to cammingly force the finger 39 out of the safety recess 98 when the striker is pulled rearwardly as during the cocking operation thereof. It will be noted that in this neutral or re-bounded position the striker 31 is

spaced slightly back from its extreme fired or forward position and so leaves a space at the forward end of the chamber 68 in front of the front face of the striker. In this re-bounded position of the striker this slightly retracted position of the striker allows the firing pin 82 to be retracted from engaging the cartridge and the rear end of the firing pin projects into the chamber 68 and so is ready to be engaged by the striker as appears in dotted lines in Figs. 4 and 5. By reason of the striker being held back by the sear engaging the safety notch 98, the gun cannot be accidentally fired by a blow upon the tail of the striker.

To move the striker from this neutral or re-bounded position shown in Fig. 4 to the cocked position of the rifle shown in Fig. 5 the tail of the striker is grasped by the shooter and drawn rearwardly to the position of the parts shown in Fig. 5. During this movement the head 78 of the striker-retaining bolt of course remains fixed as its position is permanent relative to the breech bolt and so the rearward collar 95 remains fixed and forms a support for the rear end of the spring 75. This spring has been compressed during this rearward motion of the striker due to the forward end of the spring being engaged by the forward collar 92 which has moved rearwardly with the rearward motion of the striker due to the engagement of the forwardly facing shoulder 96 of the forward collar 92 being engaged by the rearward shoulder 89 upon the forward part of the striker. During this retraction of the striker 31 the upwardly extending sear finger 38 has engaged the slanting cam face 99 upon the striker and said sear finger 39 has been depressed against the tension of the sear so as to ride along the cam face 99 and then along the lower or outer side of the striker forward of said cam face until as the striker is brought to cocked or retracted position the tension of the sear is able to again advance inwardly this finger 39 into the full cock hole or opening 70 in the bottom wall of the striker with the rear face of said finger engaging the forwardly facing shoulder 71 at the rear of said opening 70. The finger of the sear now holds the striker in rearward and cocked position against the tension of the now more greatly compressed spring 75. It will be seen that in this position the head 78 of the striker-retaining bolt is some distance within the rearward end of the bore of the striker. It will be noted also that the forward collar 92 is in the same position relative to the striker that it was in the rebounded position, that is, the forward end of the reduced diameter part of said collar projects forwardly of the front face of the striker. The front face of the striker likewise is moved proportionately farther back from the wall 69 of the breech bolt and especially from the still projecting rear end of the firing pin 82 which is to be struck sharply by the striker when released by the sear by the pulling of the trigger. As soon as the sear finger 39 has moved into the full cocked hole or opening 70 of the striker that finger holds the striker in cocked position and the shooter's hand may be released from the tail or thumb piece of the striker.

In this cocked position of the rifle as shown in Fig. 5 the spring 75 is compressed to its maximum working compression and minimum working length and is through the forward collar 92 exerting a force urging the striker 31 forward, but movement of the striker is arrested as long as the sear finger 39 is in engagement with the shoulder 71 of the full cocked recess or hole 70.

Upon the trigger being pulled the sear 32 is

drawn away from the striker and particularly the sear finger 39 is disengaged from the full cock recess or opening 70 of the striker and the compressed spring 75 then causes the striker to fly forward. As it flies forward it gains momentum and carries the striker to the neutral or rebounded position shown in Fig. 4 under the direct force of the spring at which rebounded position the forward collar 92 has its forward end engage the rearwardly facing wall 69 and so stop the collar 92. The momentum, however, already given to the striker causes the striker to move still further forward and the striker carries with it the firing pin 82 to make its firing blow upon the cartridge and finally makes the forward end of the striker seat against the said wall 69 at the front end of the chamber of the breech bolt. The position of the parts at this instant, namely the firing position, but prior to the rebound is shown in Fig. 6. It will be understood that this forward flying of the striker is done so rapidly that it comes to this position before the shooter can really release his hold upon the trigger and so the sear finger 39 is still shown away from the striker. It will be seen that the actual firing stroke given to the firing pin is accomplished by the last part of the forward movement of the striker which is a movement entirely of momentum. During this last part of the forward movement of the striker, that is, its movement after the front end of the forward collar 92 is stopped by the wall 69, the spring 75 is being compressed again to slightly more than its minimum working compression and to slightly less than its maximum working length because its forward end is held by the rear end of the collar 92 while its rearward end is being pushed in by the last part of the forward travel of the striker which carries the rear collar 95 forward from the head of the retaining bolt 77. The amount that the coil spring is further compressed after the striker passes neutral position shown in Fig. 4 is shown by the shorter space that the spring occupies between the said two collars as may be seen by comparing Fig. 4 with Fig. 6. This difference may also be seen by comparing the immediate engagement of the rear collar 95 with the retaining bolt head 78 as seen in Fig. 4 with the forwardly spaced position of the rear collar 95 relative to said bolt head 78 as seen in Fig. 6. This change in position of parts as mentioned now enables the said spring 75 to function as a rebound spring in that the compression of the spring at once operates to move the striker back from the fired position shown in Fig. 6 to the neutral position shown in Fig. 4. The compression given to the spring operates to exert a rearward force upon the rearward collar 95 and therefore to the rear end of the striker and this force manifests itself in moving the striker rearwardly so that its forward end is no longer in contact with the wall 69 but is spaced back therefrom and also spaced back from the rear end of the firing pin. After the striker thus comes back to this rebounded position as shown in Fig. 4 the shooter releases the trigger and the sear finger 39 springs upward into the safety notch 98 and the rear end of said finger is again ready to engage the shoulder 97 and hold the striker from accidental forward movement.

Rotation of the striker in the breech bolt is prevented by means of a key pressed inward from the wall of the breech bolt and slidingly engaging a keyway 101 extending longitudinally of

the top of the body of the striker as appears in Fig. 8.

What I claim as new and desire to secure by Letters Patent is:

1. In a firearm of the rebounding-striker type, the combination of a breech bolt, a hollow striker slidingly mounted therein, a firing pin slidingly mounted in the breech bolt and adapted to be struck by said striker, a bolt for retaining the striker in the breech bolt, a single coiled spring mounted lengthwise within the striker and operatively connected at its rear end to said striker-retaining bolt and to said striker, means at the forward end of the striker directly engaged by the forward end of said spring and when said spring is compressed, normally tending to push the striker forward but having a forward projection that extends through the front of the striker and engages the breech bolt before the striker reaches the firing pin whereby the last part of the forward movement of the striker is produced by its own momentum after the spring has expanded and partly recompresses the spring and thereby causes the striker to rebound from the firing pin.
2. In a hand-cocked, bolt action, firearm of the rebounding-striker type, the combination of a receiver, a breech bolt slidingly mounted therein and having a chamber in its rear portion and a firing-pin slot in its forward portion extending to said chamber in a plane spaced from the axis thereof, a firing pin slidingly housed in said slot, a tubular striker slidingly mounted in said breech bolt chamber and having its bore constricted at both ends, a headed bolt for retaining the striker in the breech bolt, said retaining bolt having its forward part fastened in the breech bolt forward of its chamber and having its shank extend rearwardly axially through the bore of the striker, the head of said retaining bolt being adapted to pass through the constricted opening at the rear of the bore of the striker, two spaced collars slidingly mounted on the shank of said retaining bolt and within the unconstricted portion of the bore of said striker, the rear collar having its rearward movement limited by the head of said retaining bolt and by the constriction at the rear of said bore, the forward collar being adapted to engage the rear face of the forward constriction of said striker, and having a forwardly projecting sleeve of reduced diameter, longer than the front constriction and adapted to pass therethrough and therebeyond and engage the forward wall of the breech bolt chamber before the striker engages said wall when said front collar and striker travel forwardly together with said front collar engaging the rear face of said front constriction and a single compression coiled spring mounted about the shank of said retaining bolt between said front and rear collars.
3. In a rebounding striker construction for firearms, the combination of a breech bolt, a hollow striker slidingly mounted therein, a firing pin slidingly mounted in the breech bolt and adapted to be struck by said striker, a bolt piercing the striker and retaining the striker in the breech bolt, a single coiled spring mounted lengthwise within the striker about the retaining bolt and operatively and independently connected at its rear end to said striker-retaining bolt and to said striker, means at the forward end of the striker directly engaged by the forward end of said spring and when said spring is compressed, normally tending to push the striker forward but having a forward projection that extends through the front of the striker and engages the breech

bolt before the striker reaches the firing pin whereby the last part of the forward movement of the striker is produced by its own momentum after the spring has expanded and partly re-
5 compresses the spring and thereby causes the striker to rebound from the firing pin.

4. In a rebounding striker construction for fire-
arms, the combination of a breech bolt having a
chamber in its rear portion, a firing pin slidingly
10 housed in the forward part of said breech bolt
and extending to the chamber thereof, a tubular
striker slidingly mounted in said breech bolt
chamber and having its bore constricted at both
ends, a headed bolt for retaining the striker in
15 the breech bolt, said retaining bolt having its
forward part fastened in the breech bolt forward
of its chamber and having its shank extend rear-
wardly axially through the bore of the striker,
the head of said retaining bolt being adapted to
20 pass through the constricted opening at the rear

of the bore of the striker, two spaced collars slid-
ingly mounted on the shank of said retaining bolt
and within the unconstricted portion of the bore
of said striker, the rear collar having its rear-
ward movement limited by the head of said re- 5
taining bolt and by the constriction at the rear
of said bore, the forward collar being adapted
to engage the rear face of the forward constrict-
ion of said striker, and having a forwardly pro-
jecting sleeve of reduced diameter, longer than 10
the front constriction and adapted to pass there-
through and therebeyond and engage the forward
wall of the breech bolt chamber before the striker
engages said wall when said front collar and
striker travel forwardly together by reason of 15
said front collar engaging the rear face of said
front constriction and a single compression coiled
spring mounted about the shank of said retaining
bolt between said front and rear collars.

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