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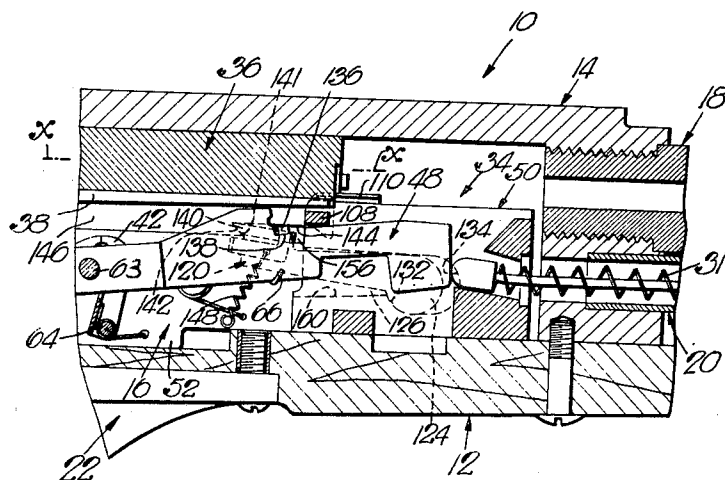
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[54] **DEVICE FOR DISABLING FIREARM ACTION ON CARTRIDGE FEED INTERRUPTION THERETO**
16 Claims, 12 Drawing Figs.

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42/17
 [51] Int. Cl. **F41d 9/00,**
F41c 13/00
 [50] Field of Search **89/137,**
138; 42/16, 16.5, 17, 17.7

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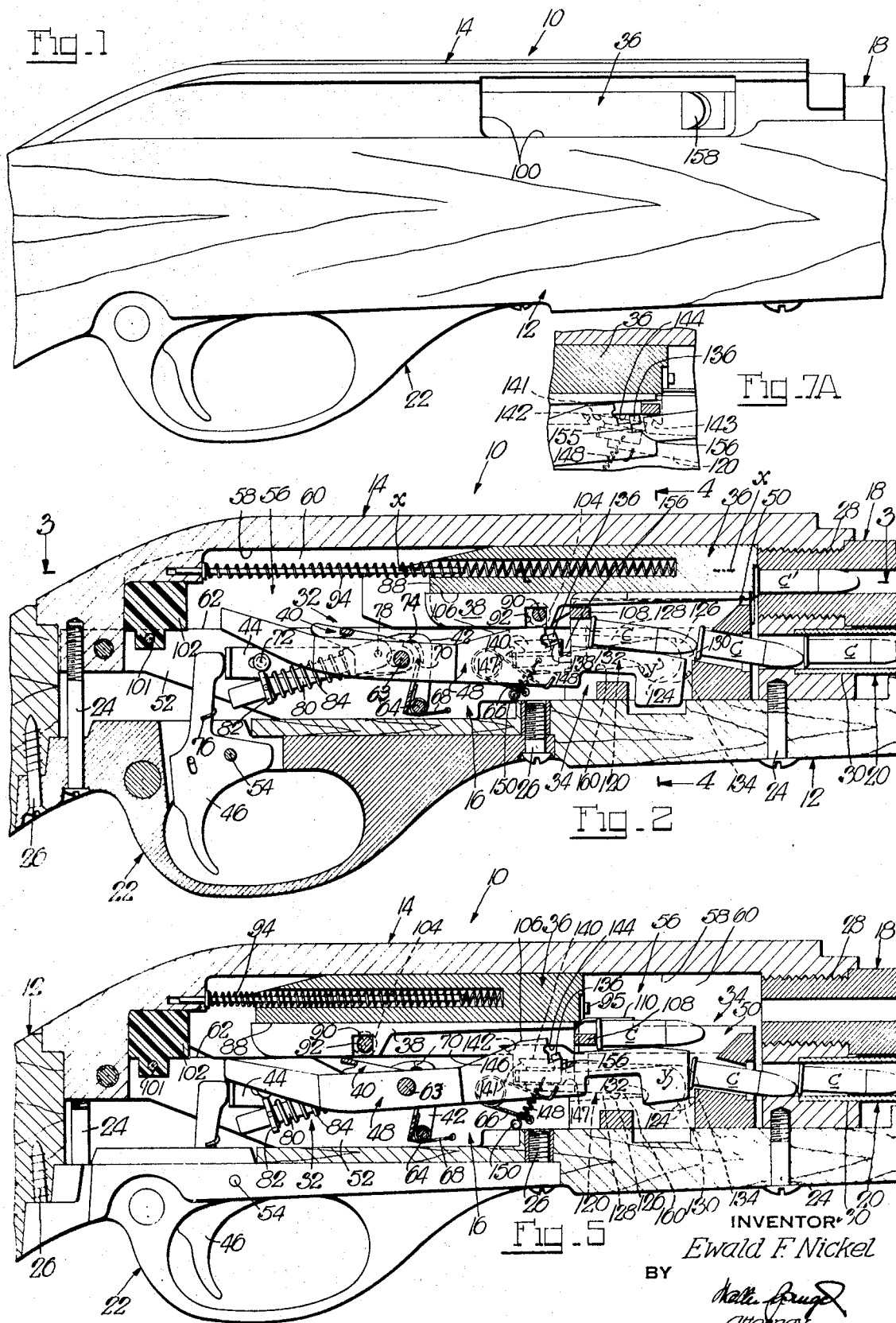
ABSTRACT: The disclosure deals with an action disabling device in a firearm having among its conventional components a spring-closed breech bolt, a tube-type magazine, and a pivoted cartridge lifter. The disabling device is in the form of a spring-loaded latch part having with a fixed member of the action a floating pivot connection over a limited range, with the latch part being in its normal position at one end of its floating range in follower relation with the cartridge lifter such that on overtravel of the latter in lift direction for lack of a cartridge thereon, the part is turned into the closing path of the breech bolt and is on partial closure of the latter shifted by the same to the other end of its floating range at which it not only locks the breech bolt against complete closure but is itself also out of follower relation with the lifter and, hence, free for subsequent spring-retraction from locking relation with the breech bolt on mere manual backup of the latter from its partial closure.

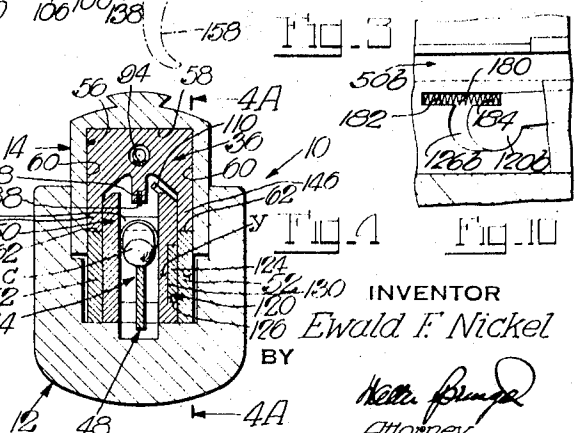
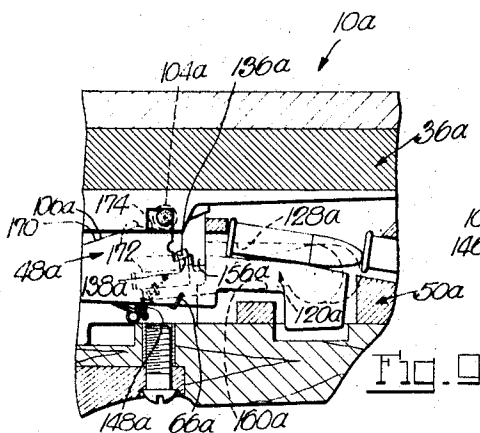
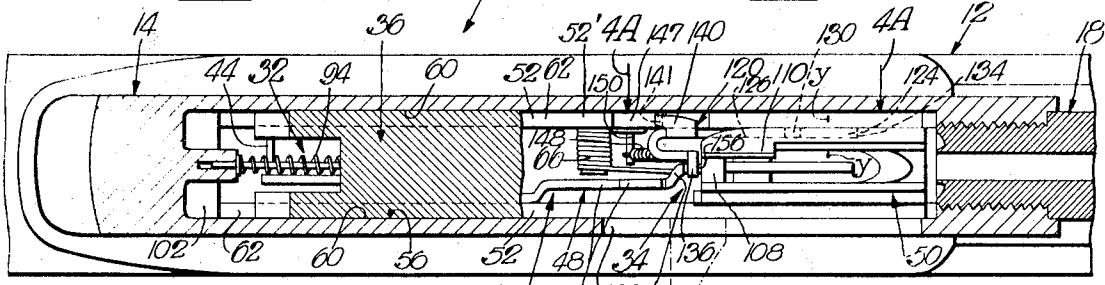
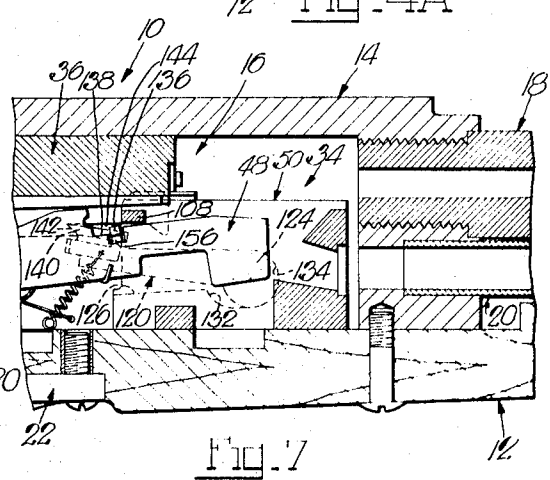
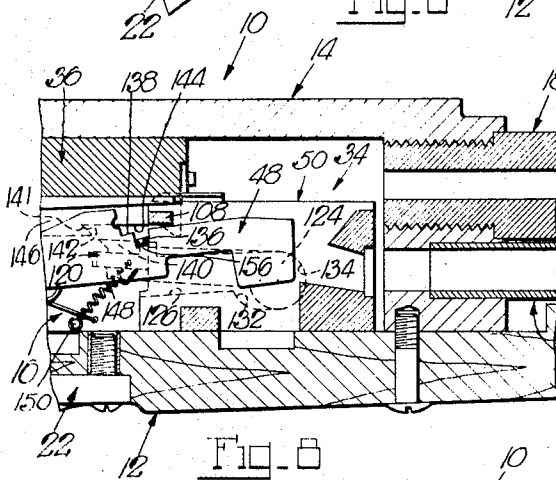
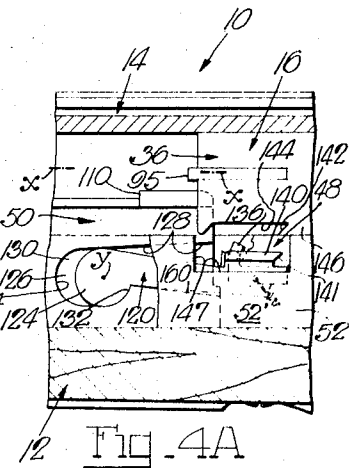
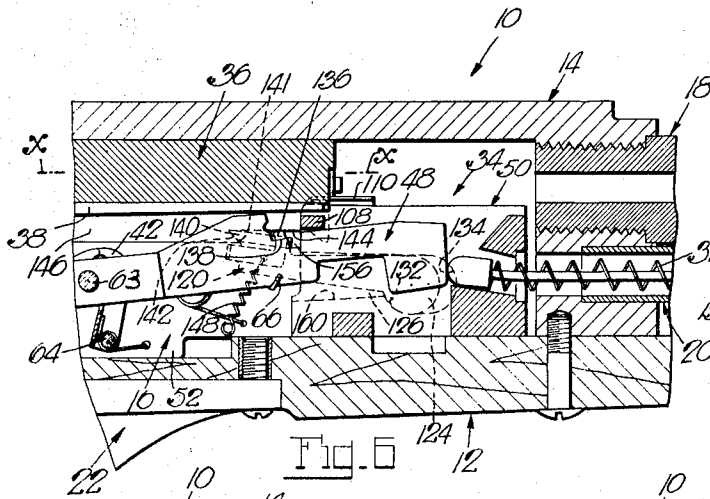


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DEVICE FOR DISABLING FIREARM ACTION ON CARTRIDGE FEED INTERRUPTION THERETO

This invention relates in general to repeater-type firearms of automatic breech bolt operation, and more particularly to action disabling devices for firearms of this type responding to cartridge feed interruption from a magazine of tubular type to the action from any cause.

It is an object of the present invention to provide in a firearm of this type the aforementioned disabling device not only in exceedingly simple structural form, but also so that the same is for its proper action disabling and also restoring performance actuated solely by conventional operating parts of the action in their normal mode of operation under all conditions, including cartridge feed interruption to the feed throat whether due to an empty magazine or due to a cartridge jam in the magazine.

It is another object of the present invention to provide in a firearm of this type the aforementioned disabling device which has a spring-loaded latch part arranged to be actuated for its action disabling and restoring function by both, the cartridge lifter and breech bolt in their normal mode of operation, with normal operation of the lifter to overtravel in lift direction when without a cartridge being relied on positively to lift the latch part into interference elevation in the closing path of the breech bolt through follower cooperation with the lifter, and additional normal closing operation of the breech bolt to the extent of a relatively short initial part of its closing motion being relied on to take the elevated latch part along and against a fixed stop in the action to lock the breech bolt against further closing motion, with the latch part being on its brief travel with the breech bolt to the stop also removed from follower relation with the lifter and, hence, free for retraction by its spring from its interference elevation to a noninterfering level on mere backup of the breech bolt therefrom to restore the action. With this arrangement, overtravel of the lifter when without a cartridge is used to good advantage to condition the latch part for its action-disabling function, yet the lifter in its overtravel position is, by the additional operation of the breech bolt required for disabling the action, effectively circumvented as a barrier against retraction of the latch part from interference with the breech bolt to restore the action on mere backup of the breech bolt from the interfering latch part.

It is a further object of the present invention to provide in a firearm of this type the aforementioned disabling device in which the spring-loaded latch part is by its spring also returned into follower relation with the cartridge lifter on completely closing the breech bolt following its release from the interfering latch part. To achieve this, there is provided in the action another stop against which the latch part is normally urged by its spring and on which it rests at its aforementioned noninterfering level at which it is, however, above the lifter in its depressed cartridge-receiving position when the breech bolt is about closed and, hence, is then clear of the lifter for its spring-return into follower relation with the latter. The advantage of this arrangement is, of course, that the return of the latch part into follower relation with the lifter in readiness for the next cyclic action disabling and restoring performance is entirely automatic, with both, action restoration and cycle completion of the latch part being achieved on mere manual backup of the breech bolt from the interfering latch part.

Another object of the present invention is to provide in a firearm of this type the disabling device in its entirety in the form of a single spring-loaded part which is the aforementioned latch part that may conveniently and advantageously be a blanked part requiring no machining and, hence, being of exceedingly low cost.

A further object of the present invention is to make provisions in a firearm of this type for supporting in exceedingly simple manner the aforementioned single latch part for its multidirectional operational movements. This is achieved by providing between the latch part and a fixed member of the action a floating pivot connection of limited floating range, with the motion of the latch part into and from interference with the breech bolt being pivotal, and its motion with the

breech bolt and return into follower relation with the cartridge lifter being over the floating range of the connection, and with one end of this floating range even forming the aforementioned fixed stop against which the latch part rests when locking the breech bolt against closure.

It is another object of the present invention to provide in a firearm of this type the aforementioned floating pivot support for the latch part solely by simple configuration of existing parts and, hence, without any additional part or parts. This is achieved by providing the latch part at its end opposite its follower end with an enlarged pivotlike disc formation, and providing in a fixed surface of the action a longitudinal recess in which the latch part is received with freedom for its operational movements, with an end length of the recess equal to the floating range of the pivot support receiving the pivot formation on the latch part with a sliding fit. With this arrangement, the recess advantageously forms both of the aforementioned stops for the latch part, including the one on which the latter rests at its noninterfering level.

It is a further object of the present invention to provide in a firearm of this type the aforementioned recess preformed, and preferably precast, in one side of the feed throat part so that the latch part may be inserted in this recess and thereby assembled with the feed throat part before the latter is assembled with the remaining components of the action.

Another object of the present invention is to provide in a firearm of this type the breech bolt and the aforementioned latch part with companion shoulders of which that on the latch part is the interference shoulder in the path of the other shoulder on the breech part for disabling the action, with both shoulders being undercut so that on their engagement they are interlocked with each other against retraction of the latch part from the breech bolt to its noninterfering level. With this arrangement, the lock of the breech bolt in its action-disabling position is sufficiently positive to withstand any shock to which the firearm may be subjected, and the force of the spring for withdrawal of the latch part from interference with the breech bolt on backup of the latter may be entirely adequate to perform this function without fail under any and all conditions, yet wholly inadequate to interfere in the least with the firm operational interlock between the undercut shoulders on the latch part and breech bolt prior to backup of the latter for restoring the action, for their interlock, being forced by the customarily quite powerful return spring for the breech bolt, is particularly firm.

A further object of the present invention is to make provisions in a firearm of this type for reliable performance by the aforementioned latch part of its designated action-disabling function on each cartridge feed interruption to the action regardless of how strong the recoil reaction of the firearm to firing by be. Thus, with the action intact, the latch part is in follower relation with the cartridge lifter when it is spring-held at the one end of its floating pivot range from which it may, however, be moved counter to the spring to the opposite end of the range in a direction opposite to recoil direction of the firearm in firing, wherefore the latch part may despite its spring remain sufficiently unaffected by particularly powerful recoil of the firearm to become displaced from follower relation with the lifter which by its fixed pivot mount in the action is subjected to the full recoil force, in which case the latch part will be inoperative on the next cartridge feed interruption to the action. In order to avoid this, the cartridge lifter and latch part are coordinated so that in the intact action the latch part is in follower engagement with the lifter in all positions of the latter including its depressed cartridge receiver position at the time of firing a cartridge, and the lifter and latch part are over the follower area of the latter on the former provided with companion surfaces which are inclined such that in their engagement and with the assistance of the spring force on the latch part they couple the latter to the lifter with adequate firmness to compel the latch part to take substantially the full recoil force the same as the lifter and thereby keep the latch part in follower relation with the latter.

Further objects and advantages will appear to those skilled in the art from the following, considered in conjunction with the accompanying drawings.

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

FIG. 1 is a fragmentary side view of a firearm embodying the present invention;

FIG. 2 is a fragmentary longitudinal section through the same firearm;

FIG. 3 is a fragmentary section through the firearm taken substantially on the line 3-3 of FIG. 2;

FIG. 4 is a fragmentary section through the firearm taken substantially on the line 4-4 of FIG. 2;

FIG. 4A is a fragmentary section through the firearm taken substantially on the line 4A-4A of FIG. 3;

FIG. 5 to 7, 7A and 8 are fragmentary sections through the firearm similar to FIG. 2, but showing the action in different stages of operation;

FIG. 9 is a fragmentary longitudinal section through a firearm embodying the present invention in a modified manner; and

FIG. 10 is a fragmentary section through a modified firearm.

Referring to the drawings, and more particularly to FIGS. 1 to 4 thereof, the reference numeral 10 designates a repeater firearm having as its major components a stock 12, a receiver 14 with an action 16 therein, a barrel 18, a tube-type magazine 20, and a trigger guard 22. The receiver 14 and trigger guard 22 are suitably mounted in the stock 12 by screws 24 and 26, and the barrel 18 and magazine 20 are at 28 and 30 mounted in the forward end of the receiver 14. The magazine 20 has the usual spring 31 (FIG. 6) for the feed of cartridges *c* to the action 16.

The action 16 has as its major operating components a firing mechanism 32 and a cartridge transfer device 34. The firing mechanism 32 provides a breech bolt 36 with a firing pin 38, a hammer 40, a sear 42, a link 44 and a trigger 46, while the transfer device 34 provides a cartridge lifter 48 and a feed throat 50. All of these parts, except the trigger 46 and the breech bolt 36 with its firing pin 38, are in this instance mounted on and between spaced side plates 52 and form therewith a preferred preassembled unit (FIGS. 2 to 4), while the trigger 46 is at 54 pivoted in the guard 22, and the breech bolt 36 is received for movement in the direction of its axis *x* in a guideway 56 which is formed in the receiver 14 by the top and opposite sidewalls 58 and 60 thereof and by the top surfaces 62 of the side plates 52 (see also FIG. 4). The hammer 40 and lifter 48 are pivoted on a common crosspin 63 between the side plates 52, and the sear 42 is pivoted on another crosspin 64 between these plates, with the lifter 48 being normally urged by a spring 66 in lift direction, and the sear 42 being normally urged by a spring 68 into the position in FIG. 2 in which it is with its nose 70 in interlock with a shoulder on the hammer 40 and holds the latter in its cocked position. The link 44 is mounted for limited longitudinal movement on the crosspin 63 and on a stud 72 on one of the side plates 52, and the same has at its forward end a shoulder 74 which cooperates with a similar shoulder on the sear 42 to retract the latter from interlock with the cocked hammer 40 on pulling the trigger 46 against the force of its return spring 76. Pivottally connected at 78 with the hammer 40 is a link 80 which extends through and is slidable in a pivoted seat 82 for a preloaded spring 84 which surrounds the link and through the latter forces the hammer into striking engagement with the firing pin 38 for firing the chambered cartridge *c'* (FIG. 2) when on the pull of the trigger the cocked hammer is released from the sear. The feed throat part 50 is also suitably mounted between the side plates 52, and the preassembled unit is, in turn, suitably mounted with its side plates 52 in the receiver 14.

The firing pin 38 is slidably received in a guide groove 88 in the breech bolt 36, and is held therein for limited operational movement by a crosspin 90 in the bolt which extends through

an elongated notch 92 in the firing pin. The breech bolt 36 is normally urged into closed position by a spring 94 (FIG. 2), and the same carries at its forward end the usual extractors 95 (FIG. 5). The receiver 14 is provided with the usual side port 100 (FIG. 1 and 3) through which an extracted cartridge shell is ejected on rearward excursion of the breech bolt following the firing of the cartridge. Rearward excursion of the breech bolt 36 is responsive to firing a cartridge, the bolt being in this instance blown rearwardly by the powder gases of the fired cartridge. Mounted at 101 in the receiver 14 is a pad 102 of nonmetallic material, such as nylon, against which the blown-back breech bolt 36 impacts with minimum noise.

The firearm described so far may be entirely conventional and forms no part of the present invention except insofar as it enters into combination therewith. In its operation, the same is shown in FIG. 2 in condition ready for firing. In this condition, a roller 104 on the crosspin 90 in the closed breech bolt also cooperates with the cam formation 106 on the lifter 48 to hold the latter in its depressed position in which it is in lift relation with the last admitted cartridge in the feed throat 50. This latter cartridge is by the following spring-urged cartridges in the magazine 20 urged against a stop lug 108 in the throat 50 and thus stops the feed of an additional cartridge or cartridges from the magazine into the throat. On pulling the trigger 46, the chambered cartridge *c'* will be fired, whereupon the breech bolt 36 will by the powder gases be blown rearwardly against the force of the spring 94 and will on impact with the pad 102 be immediately returned to its closed position by the spring 94. During its rearward excursion in this manner, the breech bolt 36 will cam the hammer 40 into the depressed, cocked, position in FIG. 2 in which it will be locked by the sear 42, and the roller 104 on the breech bolt will cooperate with the cam formation 106 on the lifter 48 to permit spring-urged upswing of the latter during which it carries the cartridge thereon to the top of the feed throat 50 until stopped when this cartridge reaches the usual top lip 110 on the throat at which the cartridge is held in chambering relation with the retracted breech bolt (FIG. 5). During such upswing of the lifter 48 the same also holds the nearest cartridge from entering the throat 50 (FIG. 5). On the succeeding spring-urged excursion of the breech bolt 36 into its closed position, the same will chamber the cartridge in its path in usual manner and also operate the lifter 48 into its depressed position to admit the next cartridge into the throat 50 and also into lift relation with the lifter (FIG. 2), whereupon the firearm is again ready for firing, as will be readily understood.

In accordance with the present invention, there is provided in the firearm a device which will disable the action on cartridge feed interruption to the feed throat from any cause. More particularly, the device will on such cartridge feed interruption hold the breech bolt in open position and thus not only disable the action but also indicate quite unmistakably the absence of a cartridge in the feed throat and, hence, also in the firing chamber. Thus, while the breech bolt in its open position calls for reloading of the magazine with cartridges or for repairing some malfunction of the cartridge feed, such as a possible cartridge jam in the magazine, the important safety aspect of the device is full expectation by anyone that the firearm is ready for firing whenever the breech bolt is observed to be closed and, hence, must be handled with appropriate care in any event, i.e., whether the firearm is actually ready for firing, or whether no cartridge is chambered but the device has previously been manipulated to restore the action by permitting the breech bolt to close in a manner to be explained. The device is in the form of a single spring-urged latch member 120 which is arranged to be actuated for its action-disabling function by the cartridge lifter 48 and also the breech bolt 36 in their normal mode of operation. To this end, the latch member 120 is mounted in the action for movement in two transverse directions, in one of which it is movable into and form the path of the breech bolt in closing direction, and in the other of which it is movable parallel to the bolt axis over a limited range, with the spring acting on the latch member

normally to urge the same out of the bolt path and to one end of its range. Normal operation of the lifter 48 relied on for actuating the latch member 120 is spring-urged overtravel of the lifter in upswing or lift direction without a cartridge thereon into the position in FIG. 6 in which the same bears against the stop lug 108 in the feed throat 50, while normal operation of the breech bolt relied on for actuating the latch member is closing motion of the bolt. Thus, it is on such overtravel of the lifter that the latch member is to be moved into the path of the breech bolt through follower cooperation with the lifter, and it is on a relatively short initial part of the closing motion of the breech bolt that the latter is to take the latch member in its path along to the other end of its range at which it is out of follower relation with the lifter and also locks the breech bolt in an open position. In order to restore the action, it is merely necessary manually to back the breech bolt from this open position sufficiently to permit spring-retraction of the latch member from the bolt path and, hence, full closure of the bolt by its spring.

The latch member 120 is of general lever configuration and has for its movability in the aforementioned transverse directions a preferred floating pivot mount in the action over a limited floating range. To this end, the latch member 120 is at one end provided advantageously with a disc formation 124 about an axis y which is the pivot axis of the member (FIGS. 2 to 4), and a fixed part of the action, in this instance the feed throat part 50, is provided in one side with a recess 126 in which the latch member 120 is received and in this instance also retained by one of the side plates 52 (FIGS. 3 and 4). The recess 126, which is advantageous preformed, and preferably precast, in the feed throat part 50, is formed in two sections 128 and 130 which are continuous with each other and receive an intermediate length and the pivot end 124 of the latch member, respectively. As best shown in FIGS. 2 and 4A, the recess section 130 is elongated in the direction of the bolt axis x and is of uniform width to receive the pivot end 124 of the latch member with a sliding fit, with the opposite ends 132 and 134 of this recess section 130 being preferably formed circularly to conform to the disc-shape of the pivot end of the latch member except where the recess section 130 is continuous with the other recess section 128. The latch member 120 is thus with its pivot end 124 movable in the recess section 130 over the length of the latter which is the limited floating range for the latch member. The other recess section 128 is open at the rear end of the feed throat part 50 and the latch member 120 extends therebeyond, with the latch member having in this recess section 128 freedom to turn about the axis y of its pivot end into and from the path of the breech bolt. The latch member 120 has at its other or follower end a follower formation 136 (FIG. 3) for cooperation with the lifter when the latch member is at the end 132 of its floating range (FIGS. 2 and 5), and the lifter 48 has a shoulder 138 with which the formation 136 is then in follower relation. The latch member 120 has at its follower end also a lock formation 140 with which the member is turnable into and from the path of the breech bolt. For cooperation of the breech bolt 36 with the lock formation 140 of the latch member in its path, the bolt is provided with a shoulder 142 formed conveniently by one end wall of a notch 144 in one of the opposite sides 146 of the bolt that slide on top of the side plates 52 (FIGS. 3 to 5). Also, for preferred cooperation explained hereinafter between the breech bolt 36 and the latch member 120, the shoulder 142 on the bolt and the active shoulder 141 of the lock formation 140 of the latch member are inclined to the bolt axis x (FIG. 6). Further, the side plate 52' on which the side of the bolt with the lock notch 144 slides is provided with a clearance notch 147 in which the lock formation 140 of the latch member has operational freedom into and from cooperation with the lock notch 144 (FIGS. 2, 3 and 4A). Anchored to the follower end of the latch member 120 is one end of an exemplary tension spring 148 which is with its other end anchored to a pin 150 in one of the side plates 52, with this spring being in this instance so inclined to the bolt axis x as normally to urge the latch

member to the end 132 of its floating range and also out of the path of the breech bolt and into follower relation with the lifter 48 (FIGS. 2 to 5).

In normal operating condition of the firearm, i.e., when cartridges are available in the magazine 20 and cartridge feed to the throat 50 is intact, the action disabling device in the form of the spring-urged latch member 120 is inoperative, with the latter being then in follower relation with the lifter 48 in all normal operating phases of the action, including those in FIGS. 2 and 5 in which the lifter is in its normal lowermost and uppermost positions, respectively. Assuming now that in the firing condition of the firearm in FIG. 2 the chambered cartridge c' was the last one fed from the magazine 20 into the throat 50, the latch member 120 will then be activated to disable the action on firing this last cartridge. Thus, on firing this last cartridge and ensuing blow-back of the breech bolt 36, the lifter 48, being then without a cartridge, will be spring-urged beyond its normal raised position in FIG. 5 and lift the following latch member 120 with its lock formation 140 into the notch 144 in the breech bolt when the latter reaches its fully open position. As the spring 94 then starts the breech bolt toward closure, the inclined locking shoulders 141 and 142 on the latch member and bolt will engage each other and positively interlock against spring-retraction of the latch member from the bolt path (FIG. 6) whereupon on continued closing motion of the bolt the interlocked shoulders 141 and 142 will shift the latch member 120 to the other end 134 of its floating range at which it, and with it the breech bolt, are locked against further movement in bolt-closing direction, with the breech bolt being then locked in the open position shown in FIG. 7 in which the action is disabled and the bolt then also indicates the lack of a cartridge in the throat.

As previously mentioned, the latch member 120 is out of follower relation with the lifter 48 when the former is at the end 134 of its floating range, as in FIG. 7. To this end, the lifter 48 is in this instance provided next to the shoulder 138 with a clearance notch 156 which in the locked condition of the bolt and latch member is aligned with the follower formation 136 on the latter (FIG. 7). However, this follower formation 136 on the latch member is, by interlock of the latter with the breech bolt at 141 and 142, held out of the clearance notch 156 in the lifter, and it is only on manual backup of the bolt from the latch member sufficiently to release them from their interlock that this follower formation 136 will, by retract action of the spring 148 on the latch member, enter the clearance notch 156 and thereby permit retraction of the lock formation 140 on the latch member from the bolt path (FIG. 8).

The notch 144 in the bolt 36, which at one end provides the lock shoulder 142, is at its other end provided with a similar inclined shoulder 143 that acts as a cam in depressing the follower formation 136 on the latch member into the clearance notch 156 in the lifter on manual retraction of the bolt from the locked position in FIG. 7, if the spring 148 should fail to so depress this follower formation 136 into the clearance notch 156. Thus, FIG. 7A indicates a condition in which the spring 148 has drawn the follower formation 136 on the latch member 120 against the sidewall 155 of the clearance notch 156, with the force of the spring 148 being insufficient to draw the follower formation from its indicated hang-up on the sidewall 155 of the clearance notch 156 into the latter even though the bolt has been manually retracted sufficiently to clear with its lock shoulder 142 the lock shoulder 141 on the latch member. However, on slight further manual retraction of the bolt 36 beyond the position in FIG. 7A, the end shoulder 143 of the notch 144 in the bolt will positively cam the follower formation 136 into the clearance notch 156 and thereby withdraw the latch member with its lock shoulder 141 from the bolt path.

For convenient manual backup of the breech bolt to the end of restoring the action as well as for occasional manual opening and closing of the bolt, the same is provided with a handle 158 which projects through the side port 100 in the receiver

(FIGS. 1 and 3). Of course, once the latch member 120 is thus removed from the bolt path, the bolt is free to close under the action of its spring 94. It is thus that on the described manual backup of the breech bolt from the interfering latch member and release of the breech bolt for its spring closure the action is restored, and this holds true whether or not the magazine has in the meantime been reloaded with cartridges or a possible cartridge jam in the magazine restored. As the breech bolt then closes, the same will depress the lifter to its lowermost, cartridge-receiving, position in FIG. 2, in the course of which the latch member 120 will follow the lifter until the former comes to a rest position on the wall 160 of the recess section 128 in the throat part 50 (FIG. 2) in which the follower formation 136 on the latch member clears the notch 156 in the still descending lifter and thereby permits the spring 148 to return the latch member to the other end 132 of its floating range at which the formation 136 on the latch member is again in follower relation with the lifter at its shoulder 138 (FIG. 2). At this stage, the latch member has completed an operating cycle in disabling and then restoring the action, and the same is now ready for the next cyclic operation on the next cartridge feed interruption to the throat 34, as will be readily understood. This means also that on restoring the action in the described manner and then manually opening the breech bolt without first reloading the magazine with cartridges or repairing a possible cartridge jam in the magazine, the latch member will disable the action on the release of the breech bolt for its spring closure.

It is inherent in firing a cartridge in the present firearm that the latter, and with it its action, will respond in recoil. In this connection, the lifter 48 with its fixed pivot 63 in the action will bear the full brunt of the recoil force, whereas the latch member 120, being then at the end 132 of its floating range (FIG. 2), is not positively coupled to the action for joint recoil reaction to firing. Nevertheless, the spring 148 is arranged to exert sufficient rearward force on the latch member 120 to avoid on recoil action rearward displacement of the lifter from the latch member to an extent where the follower formation 136 on the latter could drop into the clearance notch 156 in the lifter and thereby render the latch member inoperative on the next cartridge feed interruption to the feed throat 50. However, for reliable operability of the latch member under even exceptionally severe recoil action, recourse may advantageously be had to the modified firearm 10a in FIG. 9 in which, in contrast to the described firearm 10, the inclined follower formation 136a on the latch member 120a is, in closed and, hence, firing position of the breech bolt 36a, in engagement with the similarly inclined shoulder 138a on the lifter 48a in its then normal depressed position. To this end, the wall 160a of the recess section 128a in the feed throat part 50a is so arranged that the latch member then resting thereon has its follower formation 136a at the level shown in FIG. 9, and the lifter 48a is given sufficient clearance in the action to overtravel, under its own inertia and despite its lift spring 66a, beyond its normal depressed position on the powerful and quick spring closure of the breech bolt before returning to its shown normal depressed position under the control of the breech bolt. Thus, on restoring the action on manual backup of the breech bolt from the interfering latch member, the lifter will on the ensuing spring-closure of the bolt overtravel in its depression sufficiently momentarily to retract its inclined follower formation 136a from alignment with the clearance notch 156a in the lifter into follower relation or alignment with the inclined shoulder 138a thereof, whereupon on return of the lifter to its normal depressed position under the control of the bolt (FIG. 9) its shoulder 138a will rise into engagement with the follower formation 136a on the latch member. These inclined and engaging shoulder and follower parts 138a and 136a will, with the added force of the spring 148a, couple the latch member to the lifter sufficiently positively to avoid on even severe recoil action relative displacement between the latter to an extent where the latch member would be out of follower relation with the lifter and, hence, be inoperative on the next cartridge feed interruption to the throat.

While in the foregoing description of the modified firearm 10a of FIG. 9 inertial overtravel of the lifter in its operational depression is relied on to admit the latch member with its formation 136a into follower alignment and then engagement with the shoulder 138a on the lifter, the same end result may advantageously be achieved by forced positive, rather than mere inertial, overtravel of the lifter in its depression. This is achieved quite simply and conveniently by arranging the cam formation 106a on the lifter 48a as shown in FIG. 9. Thus, the cam formation 106a has, for lifter depression by the bolt roller 104a, a rising lobe 170 to a high point 172, while a relatively short remaining length of the cam formation is in the form of a descending lobe 174. Accordingly, the rising cam lobe 170 will during bolt closure cause positive depression of the lifter beyond its normal depressed position in FIG. 9 to admit the latch member back into follower relation or alignment with the lifter, and the descending cam lobe 174 will in the final phase of bolt closure permit the spring return of the lifter to its normal depressed position shown in FIG. 9 in which its inclined shoulder 138a is in engagement with the inclined follower formation 136a on the latch member.

While in the described firearm of FIGS. 1 to 8 the latch member 120 is normally urged into its lower position and to the rear end of its floating range in the feed throat by the inclined tension spring 148, FIG. 10 shows a different spring, namely a compression spring 180, which performs the same function. To this end, the recess 126b in the feed throat part 50b has a groove extension 182, and the latch member 120b is notched at 184, with the spring 180 being received in the groove extension 182 and in the notch 184 in the latch member.

I claim:

1. In a firearm, the combination with an action having a spring-closed breech bolt reciprocable in the direction of its longitudinal axis, a magazine tube with a cartridge feed spring, a feed throat, and a pivoted cartridge lifter spring-urged in lift direction and bolt-operated into depressed position, with said lifter overtraveling in lift direction on cartridge feed interruption to said throat, of an action disabling device providing a member mounted in the action for movement transversely of the bolt axis into first and second positions in and out of the path of said bolt in its closing direction, respectively, and also for movement over a limited range parallel to the bolt axis, and spring means urging said member into said second position, with said member being at one end of said range in follower relation with said lifter and positively moved thereby from said second to said first position on said overtravel of the lifter, and said member being movable in bolt-closing direction from said one range end to the other range end at which it is out of follower relation with said lifter, and being cleared by said lifter for return movement to said one range end on movement of said lifter into its depressed position, whereby the bolt will on its spring closure take the member in its path along to said other range end and thereby become locked in partially closed position, and the bolt will be released for full closure on manual backup from said partially closed position.

2. The combination in a firearm as in claim 1, in which said spring means also urge said member to said one range end and hold it there on recoil reaction of the action to firing a cartridge.

3. The combination in a firearm as in claim 1, in which said bolt and member have first and second companion shoulders, respectively, of which said second shoulder is in said first position of said member in the path of said first shoulder on bolt closure, and said shoulders are undercut to be in their engagement interlocked against spring-urged motion of said member into said second position.

4. In a firearm, the combination with an action having a spring-closed breech bolt reciprocable in the direction of its longitudinal axis, a magazine tube with a cartridge feed spring, a feed throat, and a pivoted cartridge lifter spring-urged in lift direction and bolt-operated into depressed position, with said lifter overtraveling in lift direction on cartridge feed interrup-

tion to said throat, of an action disabling device providing a member, a floating pivot support in the action for said member over a limited floating range parallel to the bolt axis, with said member being turnable within said range into first and second positions in and out of the path of said bolt in its closing direction, respectively, a stop in the action on which said member rests and is slidable over said range in said second position thereof, and spring means urging said member into said second position and also in bolt-opening direction against one end of said range, with said member being at said one range end in follower relation with said lifter and positively turned thereby from said second into said first position on said overtravel of the lifter, and said member being at the other range end out of follower relation with said lifter and cleared by the latter for return movement to said one range end into follower relation with said lifter on movement of the latter into its depressed position, whereby the bolt will on its spring-closure take the member in its path along to said other range end and thereby become locked in partially closed position, and the bolt will be released for full closure on its manual backup from said partially closed position.

5. The combination in a firearm as in claim 4, in which said bolt and member have first and second companion shoulders, respectively, of which said second shoulder is in said first position of said member in the path of said first shoulder on bolt closure, and said shoulders are undercut to be in their engagement interlocked against spring-urged turning motion of said member into said second position.

6. The combination in a firearm as in claim 5, in which said shoulders are inclined to the bolt axis.

7. The combination in a firearm as in claim 4, in which said spring means is a single preloaded spring.

8. The combination in a firearm as in claim 4, in which said lifter has a clearance notch for said member so that the latter will at said other range end be out of follower relation with said lifter in any position of the latter.

9. The combination in a firearm as in claim 4, in which the pivot axis of said member is parallel to that of said lifter.

10. The combination in a firearm as in claim 4, in which said member is a lever, and said floating pivot support is provided by a recess in a fixed part in the action and a disc formation about an axis at one end of said lever, with said disc formation being fittedly received in said recess, and said recess being arranged to support said disc formation for rotation about its axis in parallelism with the pivot axis of the lifter and also for sliding movement parallel to the bolt axis over a range equal to said floating range.

11. The combination in a firearm as in claim 4, in which said member is a lever, and said floating pivot support is provided by a longitudinal groove in a fixed part in the action and an en-

larged plane disc formation about an axis at one end of said lever, of which said groove is open at one end and closed at the other end and formed in first and second longitudinal sections of different widths which are continuous with each other and extend to said open and closed ends, respectively, with said second section being arranged fittedly to receive said disc formation for rotation about its axis in parallelism with the pivot axis of the lifter and also for sliding movement parallel to the bolt axis over a range equal to said floating range, and said first section being arranged to receive a part of said lever intermediate its ends and having opposite sidewalls between which said lever has freedom to turn into said first and second positions, with one of said sidewalls forming said stop.

12. The combination in a firearm as in claim 11, in which said lever has at its other end other lifter-follower and bolt-locking formations, and said lever is coplanar with said disc formation except at said other formations.

13. The combination in a firearm as in claim 11, in which said fixed part is said feed throat.

14. The combination in a firearm as in claim 4, in which the lifter has in the action freedom for inertial travel beyond its depressed position on spring-closure of the bolt, said lifter and member have companion surfaces of which that of the member is a follower surface cooperable with said lifter surface, said stop is arranged to hold said member in said second position in which said surface thereof is in follower engagement with said lifter surface in said depressed lifter position, and said engaging surfaces are in said depressed lifter position so inclined to the bolt axis that they cooperate with said spring means in holding said member in follower engagement with said lifter on recoil reaction of the action to firing a cartridge, with said member being in said second position thereof spring-returned to said one range end on said inertial lifter travel beyond its depressed position on which said lifter surface clears said member surface for its movement into follower relation with said lifter surface.

15. The combination in a firearm as in claim 14, in which said lifter and bolt have cam and follower parts, respectively, cooperating to depress said lifter on bolt closure, with said parts being arranged positively to depress said lifter beyond said depressed position and then permit its spring return to depressed position during a final stage of the bolt movement into its closed position.

16. The combination in a firearm as in claim 8, in which said clearance notch has opposite end walls against one of which said member is urged by said spring means when at said other range end, and said breech bolt has a cam formation depressing said member into said clearance notch if on manual backup of said bolt from said partially closed position said member is in the path of said cam formation.

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