June 6, 1944. T. F. HORAN 2,350,555

TUBULAR-MAGAZINE REPEATING FIREARM

Filed Aug. 2, 1940 2 Sheets-Sheet 1

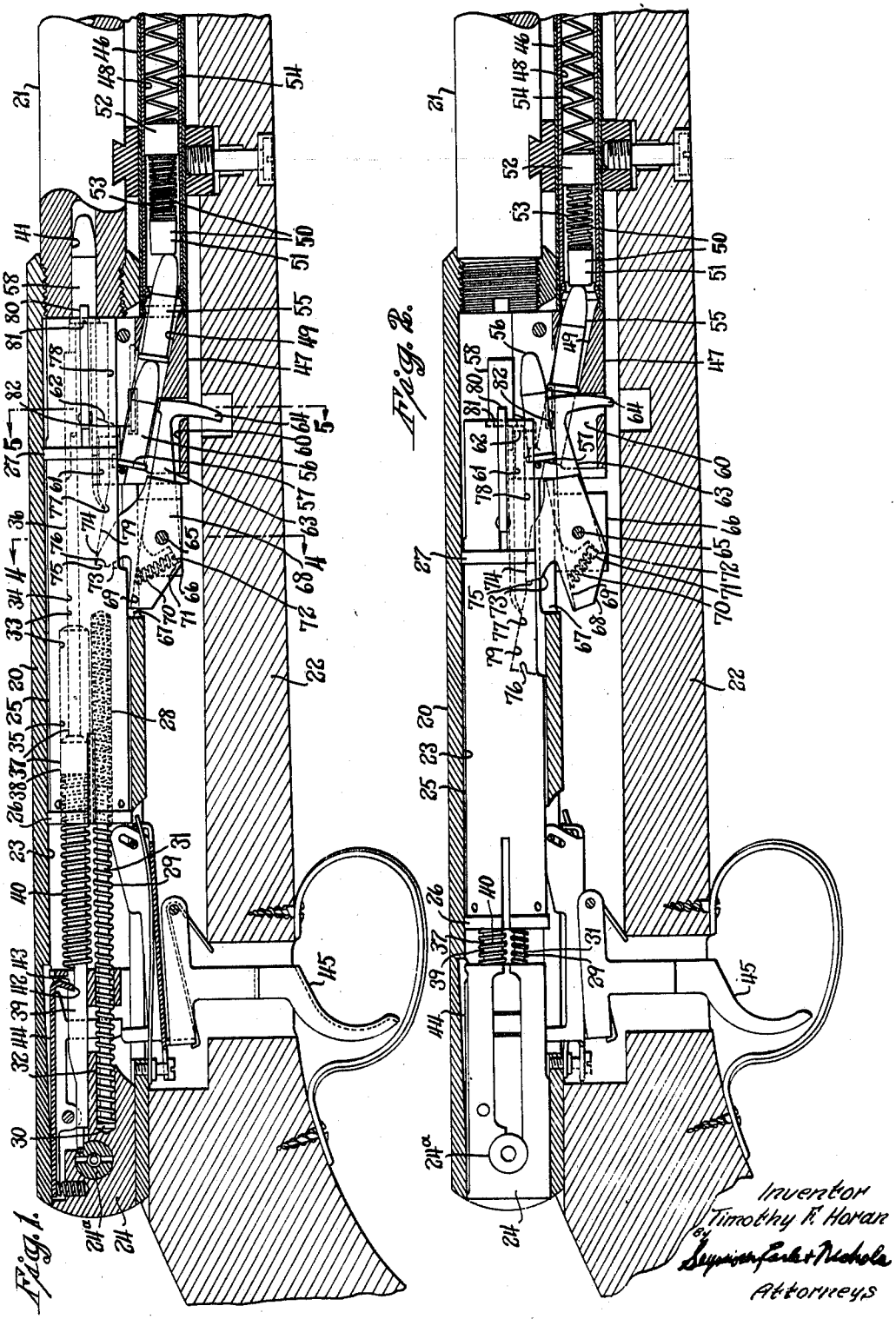


Fig. 1.

Fig. 2.

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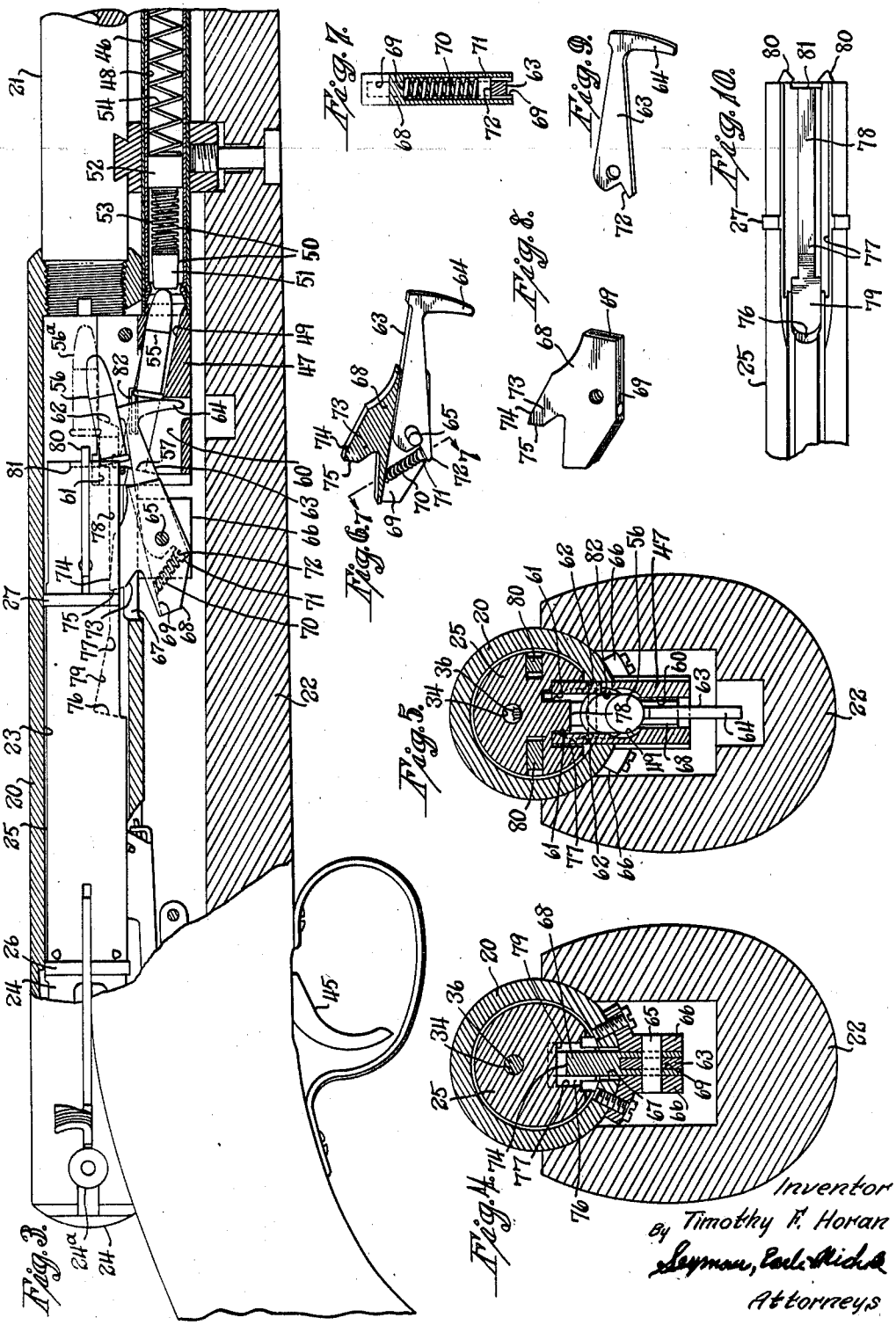


Fig. 1.

Fig. 7.

Fig. 9.

Fig. 10.

Fig. 8.

Fig. 6.

Fig. 5.

Fig. 4.

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2,350,555

TUBULAR-MAGAZINE REPEATING FIREARM

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Application August 2, 1940, Serial No. 349,435

8 Claims. (Cl. 42—17)

The present invention relates to improvements in repeating firearms and more particularly to improvements in repeating firearms of the tubular-magazine type.

One of the main objects of the present invention is to provide superior means whereby cartridges may be successively fed from a tubular-magazine into position for introduction into the cartridge-chamber of the firearm by the breech-bolt unit or its equivalent.

A further object of the present invention is to provide a tubular-magazine repeating firearm with superior means whereby the column of cartridges in the tubular-magazine is released one by one for transfer in a direction substantially laterally of the axis of the gun into position for introduction into the cartridge-chamber of the firearm.

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 and which are not claimed in any separate application.

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

Fig. 1 is a broken view in vertical central-longitudinal section of the portion of a firearm adjacent the receiver thereof and showing the present invention, the parts being shown in the positions which they assume when the breech-bolt is in its breech-closing position and the firing-member is cocked;

Fig. 2 is a view generally corresponding to Fig. 1 save that certain of the parts are left in side elevation and the parts are shown in the positions which they assume when the breech-bolt is part way retired rearwardly from its breech-closing position;

Fig. 3 is a view similar to Fig. 2 with the parts shown in the positions which they assume when the breech-bolt reaches the limit of its rearward travel;

Fig. 4 is a transverse sectional view taken on the line 4—4 of Fig. 1;

Fig. 5 is a similar view but taken on the line 5—5 of Fig. 1;

Fig. 6 is a perspective view of the unit comprising the cartridge-elevator, the actuating-member therefor and the pivot pin;

Fig. 7 is a sectional view taken on the line 7—7 of Fig. 6 but on a larger scale;

Fig. 8 is a perspective view of the actuating-member;

Fig. 9 is a similar view of the cartridge elevator; and

Fig. 10 is a broken underside view of the forward portion of the breech-bolt.

The particular tubular-magazine repeating firearm herein chosen for the purpose of illustrating the present invention is of the self-loading type, that is to say, of the type wherein the discharge of one cartridge automatically retires the breech-bolt and effects the ejection of the just-fired cartridge and the insertion of a fresh cartridge into the cartridge-chamber of the firearm.

The particular firearm shown in the accompanying drawings comprises a receiver 20 having rigidly attached and forwardly projecting from its forward end a barrel 21. Attached to both the receiver 20 and the barrel 21 is a stock 22.

The receiver 20, in the particular firearm shown, is of tubular form with its exterior cylindrically contoured save for certain cuts formed therein. The said receiver is formed interiorly with an axial cylindrically-contoured bolt-receiving passage 23 extending throughout the length of the receiver and at its forward end receiving the threaded rear end of the barrel 21 as shown.

Fitting into the rear portion of the bolt-receiving passage 23 in the receiver 20, is a cylindrically-contoured receiver-plug 24 which is removably retained in place in the said bolt-receiving passage in any approved manner such, for instance, as by a transversely-arranged releasable latch 24a of a character not requiring detailed description herein. Located intermediately between the forward end of the receiver-plug 24 and the rear end of the barrel 21 is a reciprocating breech-bolt 25 which generally considered is cylindrically contoured exteriorly and is formed at its rear end with an annular bearing-flange 26 and adjacent its forward end with a similar bearing-flange 27. Both the bearing-flanges 26 and 27 just referred to have a smooth sliding fit with respect to the surface of the bolt-receiving passage 23 in the receiver 20 so as to provide both support and guidance for the breech-bolt 25 in its reciprocating movement within the said receiver.

The lower rear portion of the breech-bolt 25 is formed with a longitudinal passage 28 opening through the rear face of the breech-bolt and receiving the forward portion of a helical breech-closing spring 29. The rear end of the breech-closing spring 29 just referred to is

seated against the forward face of the head 30 of a spring-guiding plunger 31 extending forwardly within the breech-closing spring 29 and part way into the passage 28 in the rear end of the breech-bolt 25, as is shown in Fig. 1. The head 30 of the spring-guiding plunger 31 and also the respective rear portions of both the spring-guiding plunger 31 and bolt-closing spring 29 are received in a forwardly-opening socket 32 extending longitudinally of the receiver-plug 24 in axial alignment with the longitudinal passage 28 in the breech-bolt 25. The breech-closing spring 29 just referred to exerts a constant but yielding effort to force the breech-bolt 25 forwardly into its breech-closing position as shown in Fig. 1.

Directly above its longitudinal axis and in parallelism with the longitudinal passage 28, the breech-bolt 25 is formed with a firing-plunger passage generally designated by the reference character 33, and having a relatively-small-diameter forward portion 34 and a relatively-large-diametered rear portion 35 which latter opens through the rear face of the breech-bolt and which former opens through the forward face thereof.

Reciprocating mainly in the forward portion 35 of the firing-plunger passage 33 in the breech-bolt 25 is the relatively-slender forward portion 36 of a firing-plunger generally designated by the reference character 37. The said firing-plunger includes a cylindrically-contoured bearing-portion 38 located about midway of its length and bearing in the relatively-large-diametered rear portion 35 of the firing-plunger passage 33. Projecting rearwardly from the bearing-portion 38 of the firing-plunger 37 is a shank 39 having its rear end extended into a suitable clearance-cut in the receiver-plug 24, as shown in Fig. 1.

Located intermediate the forward face of the receiver-plug 24 and the rear face of the bearing-portion 38 of the firing-plunger 37 is a helical firing-spring 40 encircling the shank 39 and exerting a constant but yielding effort to urge the firing-plunger 37 forwardly to discharge a cartridge in the cartridge-chamber 41 of the barrel 21.

The upper portion of the shank 39 of the firing-plunger 37 is formed with a forwardly-facing cocking-shoulder 42 adapted to be releasably engaged by the downwardly-extending sear-nose 43 of a sear 44 pivotally connected to the receiver-plug 24 as shown in Fig. 1. The said sear 44 is adapted to be actuated for releasing the firing-plunger 37 by any suitable means not requiring detailed description herein other than to say that the said release is under the control of a trigger 45.

Extending in parallelism with and beneath the barrel 21 is a magazine-housing 46 which is of tubular form and which abuts at its rear end against the forward face of a magazine-throat 47 depending from and forming a rigid feature of the forward portion of the receiver 20. In a manner usual in tubular-magazines, the magazine-housing 46 receives within it with a sliding fit a magazine-tube 48 having its open rear end in registration with the forward end of an upwardly-and-rearwardly-inclined cartridge-guiding passage 49 formed in the magazine-throat 47.

Axially movable within the magazine-tube 48 is a cartridge-follower generally designated by the reference character 50 and including a forward nose-portion 51 considerably smaller in diameter than the interior diameter of the magazine-tube 48 and flexibly connected to the guide-portion 52 of the cartridge-follower by a helical spring 53. The magazine-follower 50 is urged rearwardly by means of a magazine-spring 54 located in the magazine-tube 48 forwardly of the forward face of the guide-portion 52 of the said follower, as is shown in Figs. 1, 2 and 3.

In Fig. 1 the magazine-throat 47 and the rear portion of the magazine-tube 48 are shown as accommodating two cartridges respectively numbered 55 and 56, the rearward travel of which is checked by the engagement of the head portion of the cartridge 56 with suitable stop-shoulders such, for instance, as the stop-shoulder 57 shown in Figs. 1, 2 and 3. In Fig. 1 is also shown a third cartridge designated by the reference character 58, and shown as inserted into the cartridge-chamber 41 of the barrel 21.

The magazine-throat 47 is of substantially U-shaped form in cross section by virtue of its provision with an upwardly-opening longitudinal groove-like recess 60 which is intersected at its lower front portion by the rear end of the upwardly-and-rearwardly-inclined cartridge-guiding passage 49 in the magazine-throat. At its rear end and on each of the respective opposite sides of the recess 60 therein, the magazine-throat 47 is provided with two retaining-lips 61—61 both of which are clearly indicated in Fig. 5. The retaining-lips 61—61 just referred to, extend from the rear end of the magazine-throat 47 horizontally forwardly a short distance and terminate at their forward ends in a clearance-notch 62. The distance between the retaining-lips 61—61 in a direction crosswise of the firearm is slightly in excess of the diameter of the body-portion of the particular calibre of cartridges for which the firearm is designed. The said spacing, however, is such that the rim-portion of a cartridge cannot pass directly upwardly between the said retaining-lips 61—61 but must, in a manner as will hereinafter appear, be moved forwardly into registration with the clearance-notches 62—62 before being free for further upward movement.

Extending forwardly into the rear portion of the groove-like recess 60 in the magazine-throat 47 is the forward end of a pivotal cartridge-elevator 63 which may be conveniently formed of sheet metal. The said cartridge-elevator is formed at its forward end with a downwardly-extending cartridge-cut-off finger 64 having its forward edge curved in a vertical direction concentrically with a pivot-pin 65 about which the cartridge-elevator 63 turns. The pivot-pin 65, just referred to, is supported at its respective opposite ends in two similar and laterally-spaced-apart bracket-arms 66—66 suitably secured and depending from the under-face of the receiver 20 on each of the respective opposite sides of a vertical longitudinal clearance-slot 67 therein, all as is particularly well shown in Fig. 4.

The rear portion of the cartridge-elevator 63 is "straddled," so to speak, by the lower portion of an actuating-member 68 which is formed with a central-longitudinal and downwardly-opening groove 69 into which the rear portion of the cartridge-elevator 63 extends with freedom for pivotal movement relative to the actuating-member. The said actuating-member 68 is pivotally mounted upon the pivot-pin 65 before referred to which also serves as a pivot mounting for the cartridge-elevator 63.

Accommodated within a widened rear portion

of the longitudinal slot 69 in the actuating-member 68, is a helical spring 70 which encircles a spring-plunger 71 and urges the same downwardly into engagement with the upper rear edge of a thrust-finger 72 projecting rearwardly from the cartridge-elevator 63. Acting through the spring-plunger 71 and the thrust-finger 72 just referred to, the helical spring 70 exerts a constant but yielding effort to swing the cartridge-elevator 63 in a counterclockwise direction with reference to the actuating-member 68 for purposes as will hereinafter appear.

The actuating-member 68 is formed with an upwardly-projecting finger 73 provided with an upwardly-facing cam-surface 74 which is normally slightly inclined upwardly and rearwardly. The finger 73 of the actuating-member 68 is also formed with a substantially-rearwardly-facing abutment-face 75 engageable by a substantially-forwardly-facing abutment-face 76 formed in the under portion of the breech-bolt 25. The abutment-face 76 just referred to, constitutes the rear wall of a downwardly-opening central-longitudinal groove 77 formed in the under face of the breech-bolt and having its upper wall, in effect, divided into two portions, the forward portion of which constitutes a downwardly-facing retaining-surface 78 extending in substantial parallelism with the axis of the barrel 21, and the rear portion of which upper wall provides an actuating-cam surface 79 which, like the retaining-surface 78, is adapted to engage with the cam-surface 74 of the actuating-member 68 in a manner as will more fully hereinafter appear.

As is shown particularly well in Fig. 10, the breech-bolt is provided on each of the respective opposite sides of its vertical center line with a pair of opposed extractors 80—80 adapted to engage the rim-portion of each successive cartridge and extract the same from the cartridge-chamber 41 of the barrel 21, in a manner customary in bolt-action firearms. Intermediate the forward portions of the extractors 80—80, the front face of the breech-bolt 25 is formed with a forwardly-and-downwardly-opening rim-receiving recess 81 successively receiving the rim or head end of each successive cartridge as the same passes through the firearm structure.

For the purpose of an understanding of the mode of operation of the particular firearm herein chosen for the illustration of the present invention, let it be assumed that the parts are in the positions in which they are illustrated in Fig. 1 in which position it will be noted that the firearm is cocked preparatory to discharging the cartridge 58 and that the actuating-member 68 and the cartridge-elevator 63 are swung about the pivot-pin 65 to substantially the limit of their movement in a clockwise direction as the structure is viewed in the drawings.

With the parts in the positions as above described, the cartridge 56 will, in the main, be located above the forward portion of the cartridge-elevator 63 in position for being elevated thereby in a manner as will presently appear.

When now the firing-plunger 37 is released by pulling the trigger 45, the cartridge 58 will be discharged with the result that the breech-bolt 25 and the parts carried thereby will be rapidly moved rearwardly by the forces developed by the discharge of the said cartridge. By this movement the now-discharged cartridge 58 will be extracted from the cartridge-chamber 41 and ultimately ejected from the firearm prior to the return movement of the breech-bolt 25 into its breech-closing position.

During the first portion of the rearward travel of the breech-bolt 25 the actuating-cam surface 79 of the breech-bolt will act upon the cam-surface 74 to rock the actuating-member 68 in a counterclockwise direction, and the downwardly-facing retaining-surface 78 of the breech-bolt will be brought into position to retain the said actuating-member in the position just referred to by the time the breech-bolt reaches the position in which it is shown in Fig. 2.

The turning of the actuating-member 68 in the counterclockwise direction as just above described, will result in the further tensioning of the spring 70 carried thereby so that the cartridge-elevator 63 will also be swung in a counterclockwise direction about the pivot-pin 65 as a center, with the result that the cartridge 56 will be forced upwardly past a resilient detent 82 in the magazine-throat 47 (Fig. 5) until it is brought into engagement with the retaining-surface 78 of the breech-bolt 25, whereupon the upward movement of both the said cartridge 56 and the forward portion of the cartridge-elevator 63 will be checked momentarily.

As the forward portion of the cartridge-elevator 63 swings upwardly as above described to elevate the cartridge 56, its cartridge-cut-off finger 64 will have interposed itself in the path of rearward movement of the cartridge 55 so that the rearward travel of the latter is, for the moment, checked. The parts will now have reached the positions in which they are indicated in Fig. 2.

The continued rearward movement of the breech-bolt 25 from the intermediate position shown in Fig. 2 to the fully-retired position shown in Fig. 3, will still maintain the downwardly-facing retaining-surface 78 of the breech-bolt in engagement with the cam-surface 74 of the actuating-member 68 and will ultimately cause the shallow rim-receiving recess 81 in the forward face of the breech-bolt 25 to move into registration with the rim of the cartridge 56. As soon as this registration occurs the cartridge-elevator 63 acting under the urge of the spring 70, will swing further upwardly to elevate the cartridge 56 up into a position where its upward progress is checked by the engagement of its rear portion with the opposed retaining-lips 61—61 of the magazine-throat 47. The parts will now have assumed the positions indicated in Fig. 3, in which position the rear face of the cartridge 56 is positioned for engagement by the front face of the breech-bolt 25 when the same moves forwardly.

The next phase of the normal cycle of operation of the firearm will be the forward or return movement of the breech-bolt 25 from its fully-retired position shown in Fig. 3 to its full breech-closing position shown in Fig. 1. The initial forward movement of the breech-bolt 25 will slide the cartridge 56 forwardly until the rim of the said cartridge rides free of the retaining-lips 61—61 of the magazine-throat 47 and is brought into registration with the clearance-notches 62—62 thereof. As soon as this action takes place, the cartridge-elevator 63 acting under the urge of the spring 70, will lift the cartridge 56 into the position indicated by the broken lines 56a in Fig. 3. The continued forward movement of the breech-bolt 25 under the urge of the breech-closing spring 29, will insert the cartridge 56 into the cartridge-

chamber 41 of the barrel 21 preparatory to another cycle of operation.

The described forward movement of the breech-bolt 25 from the retired position in which it is shown in Fig. 3 to the breech-closing position in which it is shown in Fig. 1, will again bring the inclined actuating-cam surface 79 of the said breech-bolt into registration with the cam-surface 74 of the actuating-member 68 thereby permitting the said actuating-member to turn in a clockwise direction. Shortly before the breech-bolt reaches its full breech-closing position the abutment-face 75 of the actuating-member 68 will be engaged by the abutment-face 76 of the breech-bolt 25 with the effect of positively turning the actuating-member 68 in a clockwise direction and similarly positively turning the cartridge-elevating member 60 owing to the fact that the upper edge of the said member 63 will be engaged by the top wall of the groove 69 in the said actuating-member 68.

The depression of the forward portion of the cartridge-elevating member 63 resulting from its clockwise turning movement as described, will lower the cartridge-cut-off finger 64 thereof below the path of movement of the next-succeeding cartridge 55, whereupon the magazine-spring 54 will assert itself and force the said cartridge 55 rearwardly so that the same will occupy the position in which the cartridge 56 is shown in Fig. 1.

The firearm has thus been restored to the condition illustrated in Fig. 1 preparatory to another cycle of operation.

It is to be noted that in addition to positively swinging the actuating-member 68 in a counterclockwise direction when the breech-bolt 25 retires, the said breech-bolt also, by virtue of its retaining-surface 78, maintains the said actuating-member in its said counterclockwise position during the major portion of the stroke of the breech-bolt 25. This results in the initial compression of the spring 70 and hence in maintaining the cartridge-elevator under tension to turn it in a counterclockwise direction during the major portion of the rearward stroke of the breech-bolt 25, though this turning effect upon the said cartridge-elevator is of a yielding character to thus permit the said cartridge-elevator to accommodate itself to the requirements of any of the phases of the operation of the said breech-bolt and any of the phases of the elevation or transfer of a cartridge.

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. A tubular-magazine repeating firearm including in combination: a barrel having a cartridge-chamber; a receiver at the rear end of the said barrel and having a bolt-receiving passage therein extending substantially parallel with the longitudinal axis of the said barrel; a breech-bolt movable in the bolt-receiving passage in the said receiver and provided with a forwardly-facing abutment, a downwardly-inclined actuating-cam surface forwardly of said abutment and a retaining-surface forwardly of the said actuating-cam surface and extending substantially parallel with the path of movement of the said breech-bolt; a tubular-magazine extending forwardly beneath the said barrel and communicating at its rear end with the bolt-receiving passage in the said receiver in position to feed a cartridge into a position alongside of the forward end of the said breech-bolt when the latter is in its breech-closing position; and cartridge-elevating means for laterally shifting cartridges from the said tubular-magazine into position for introduction into the cartridge-chamber of the said barrel by the said breech-bolt and comprising a pivotal elevator-actuating member having a stop-abutment and positioned with relation to said breech-bolt to be sequentially engaged by the abutment, the actuating-cam surface and the retaining-surface thereof, a pivotal cartridge-elevating member associated with the said elevator-actuating member and engageable with the stop-abutment thereof and with a cartridge to laterally shift the same from the said tubular-magazine into position for introduction into the cartridge-chamber of the said barrel, and cartridge-elevating spring-means operatively interconnecting the said actuating member and the said cartridge-elevating member and constructed and arranged to yieldingly urge the said cartridge-elevating member into engagement with the said stop-abutment and into its cartridge-elevating position when the said actuating-member is engaged in sequence by the actuating-cam surface and the retaining-surface of the said breech-bolt when the said breech-bolt is moved into its retired position, the actuating-cam surface of the said breech-bolt being located in position to shift the said elevator-actuating member before the front end of the said breech-bolt has moved rearwardly beyond the rear end of a cartridge positioned alongside the breech-bolt, to thereby energize the said cartridge-elevating spring-means and cause the latter to move the said cartridge-elevating member and hence yieldingly force a cartridge against a lateral face of the said breech-bolt, the forwardly-facing abutment of the said breech-bolt being positioned to engage the said elevator-actuating member when the breech-bolt is moved forwardly to positively swing the said member and cause its stop-abutment to in turn positively swing the said cartridge-elevating member downwardly into its retired position.

2. A tubular-magazine repeating firearm including in combination: a barrel having a cartridge-chamber; a receiver at the rear end of the said barrel and having a bolt-receiving passage therein extending substantially parallel with the longitudinal axis of the said barrel; a breech-bolt movable in the bolt-receiving passage in the said receiver and provided with a forwardly-facing abutment, a downwardly-and-rearwardly-facing inclined actuating-cam surface forwardly of said abutment and a retaining-surface forwardly of the said actuating-cam surface and extending substantially parallel with the path of movement of the said breech-bolt; a tubular-magazine extending forwardly beneath the said barrel and communicating at its rear end with the bolt-receiving passage in the said receiver in position to feed a cartridge into a position alongside of the forward end of the said breech-bolt when the latter is in its breech-closing position; and cartridge-elevating means for laterally shifting

cartridges from the said tubular-magazine into position for introduction into the cartridge-chamber of the said barrel by the said breech-bolt and comprising a pivotal elevator-actuating member having a downwardly-opening longitudinal recess and a stop-abutment and positioned with relation to said breech-bolt to be sequentially engaged by the abutment, the actuating-cam surface and the retaining-surface thereof, a pivotal cartridge-elevating member movable in the aforesaid recess in the said elevator-actuating member and engageable with a cartridge to laterally shift the same from the said tubular-magazine into position for introduction into the cartridge-chamber of the said barrel, and cartridge-elevating spring-means operatively interconnecting the said actuating-member and the said cartridge-elevating member and constructed and arranged to yieldingly urge the said cartridge-elevating member into engagement with the said stop-abutment and into its cartridge-elevating position when the said actuating-member is engaged in sequence by the actuating-cam surface and the retaining-surface of the said breech-bolt when the said breech-bolt is moved into its retired position, the actuating-cam surface of the said breech-bolt being located in position to shift the said elevator-actuating member before the front end of the said breech-bolt has moved rearwardly beyond the rear end of a cartridge positioned alongside the breech-bolt, to thereby energize the said cartridge-elevating spring-means and cause the latter to move the said cartridge-elevating member and hence yieldingly force a cartridge against a lateral face of the said breech-bolt, the forwardly-facing abutment of the said breech-bolt being positioned to engage the said elevator-actuating member when the breech-bolt is moved forwardly to positively swing the said member and cause its stop-abutment to in turn positively swing the said cartridge-elevating member downwardly into its retired position.

3. A tubular-magazine repeating firearm including in combination: a barrel having a cartridge-chamber; a receiver at the rear end of the said barrel and having a bolt-receiving passage therein extending substantially parallel with the longitudinal axis of the said barrel; a breech-bolt movable in the bolt-receiving passage in the said receiver and provided with a forwardly-facing abutment, a downwardly-and-rearwardly-facing inclined actuating-cam surface forwardly of said abutment and a retaining-surface forwardly of the said actuating-cam surface and extending substantially parallel with the path of movement of the said breech-bolt; a tubular-magazine extending forwardly beneath the said barrel and communicating at its rear end with the bolt-receiving passage in the said receiver in position to feed a cartridge into a position alongside of the forward end of the said breech-bolt when the latter is in its breech-closing position; cartridge-elevating means for laterally shifting cartridges from the said tubular-magazine into position for introduction into the cartridge-chamber of the said barrel by the said breech-bolt and comprising a pivotal elevator-actuating member having a stop-abutment and positioned with relation to said breech-bolt to be sequentially engaged by the abutment, the actuating-cam surface and the retaining-surface thereof, a pivotal cartridge-elevating member associated with said elevator-actuating member and engageable with the stop-abutment thereof and with a cartridge to laterally shift the same from the said tubular-magazine into position for introduction into the cartridge-chamber of the said barrel, a cartridge-cut-off finger located at the forward end of the said cartridge-elevating member and having a forward surface extending substantially concentrically with respect to the pivot point of the said member; and cartridge-elevating spring-means operatively interconnecting the said actuating-member and the said cartridge-elevating member and constructed and arranged to yieldingly urge the said cartridge-elevating member into engagement with the said stop-abutment and into its cartridge-elevating position when the said actuating-member is engaged in sequence by the actuating-cam surface and the retaining-surface of the said breech-bolt when the said breech-bolt is moved into its retired position, the actuating-cam surface of the said breech-bolt being located in position to shift the said elevator-actuating member before the front end of the said breech-bolt has moved rearwardly beyond the rear end of a cartridge positioned alongside of the breech-bolt, to thereby energize the said cartridge-elevating spring-means and cause the latter to move the said cartridge-elevating member and hence yieldingly force a cartridge against a lateral face of the said breech-bolt, the forwardly-facing abutment of the said breech-bolt being positioned to engage the said elevator-actuating member when the breech-bolt is moved forwardly to positively swing the said member and cause its stop-abutment to in turn positively swing the said cartridge-elevating member downwardly into its retired position.

4. A tubular-magazine repeating firearm including in combination: a barrel having a cartridge-chamber; a receiver at the rear end of the said barrel and having a bolt-receiving passage therein; a breech-bolt movable in the bolt-receiving passage in the said receiver and provided with a forwardly-facing abutment, a downwardly-and-rearwardly-facing inclined actuating-cam surface forwardly of said abutment and a retaining-surface forwardly of the said actuating-cam surface and extending substantially-parallel with the path of movement of the said breech-bolt; a tubular-magazine extending forwardly beneath the said barrel and communicating at its rear end with the bolt-receiving passage in the said receiver in position to feed a cartridge into a position alongside of the forward end of the said breech-bolt when the latter is in its breech-closing position; and cartridge-elevating means for laterally shifting cartridges from the said tubular-magazine into position for introduction into the cartridge-chamber of the said barrel by the said breech-bolt and comprising a pivotal elevator-actuating member having a stop-abutment and having a downwardly-opening longitudinal recess and positioned with relation to said breech-bolt to be sequentially engaged by the abutment, the actuating-cam surface and the retaining-surface thereof, a pivotal cartridge-elevating member movable in the aforesaid recess in the said elevator-actuating member and engageable with a cartridge to laterally shift the same from the said tubular-magazine into position for introduction into the cartridge-chamber of the said barrel, a cartridge-cut-off finger located at the forward end of the said cartridge-elevating member and having a forward surface extending substantially concentrically with respect to the pivot point of the said member; and cartridge-

elevating spring-means operatively interconnecting the said actuating-member and the said cartridge-elevating member and constructed and arranged to yieldingly urge the said cartridge-elevating member into engagement with the said stop-abutment and into its cartridge-elevating position when the said actuating-member is engaged in sequence by the actuating-cam surface and the retaining-surface of the said breech-bolt when the said breech-bolt is moved into its retired position, the actuating-cam surface of the said breech-bolt being located in position to shift the said elevator-actuating member before the front end of the said breech-bolt has moved rearwardly beyond the rear end of a cartridge positioned alongside the breech-bolt, to thereby energize the said cartridge-elevating spring-means and cause the latter to move the said cartridge-elevating member and hence yieldingly force a cartridge against a lateral face of the said breech-bolt, the forwardly-facing abutment of the said breech-bolt being positioned to engage the said elevator-actuating member when the breech-bolt is moved forwardly to positively swing the said member and cause its stop-abutment to in turn positively swing the said cartridge-elevating member downwardly into its retired position.

5. In a repeating firearm including a barrel having a cartridge-chamber, a receiver at the rear end of said barrel and having a bolt-receiving passage therein extending substantially parallel to the longitudinal axis of said barrel, a breech-bolt slidable in said bolt-receiving passage, a tubular magazine extending forwardly beneath said barrel and communicating at its rear end with the bolt-receiving passage in said receiver in position to feed said cartridge into a position alongside the forward end of said breech-bolt when the latter is in its breech-closing position, and cartridge-elevating means for laterally shifting cartridges from said tubular magazine into position for introduction into the cartridge-chamber of said barrel by said breech-bolt; said breech-bolt being provided with a forwardly-facing abutment, a downwardly-and-rearwardly-facing inclined cam disposed forwardly of said abutment and a retaining surface disposed forwardly of said cam and extending substantially parallel with the path of movement of said breech-bolt; said cartridge-elevating means comprising a pivotal actuator having a shoulder and a finger, the latter being positioned with relation to said breech-bolt to be sequentially engaged by the abutment, the cam and the retaining-surface thereof, a pivotal cartridge-lifter associated with said actuator and engageable with a cartridge to laterally shift the same from said magazine into position for introduction into the cartridge-chamber of said barrel, said lifter being also engageable with said shoulder, and cartridge-elevating spring-means operatively interconnecting said actuator and said lifter and being constructed and arranged to yieldingly urge said lifter into engagement with said shoulder and into its cartridge-elevating position when said actuator-finger is engaged in sequence by the cam and the retaining surface of the breech-bolt when the breech-bolt is moved into its retired position; said cam being located in position to shift said actuator before the front end of said breech-bolt is moved rearwardly beyond the rear end of a cartridge positioned alongside the breech-bolt, to thereby energize said spring-means and cause the latter to move said lifter and hence yieldingly force the cartridge against the lateral face of the breech-bolt; said abutment being positioned to engage said actuator-finger when the breech-bolt is moved forwardly to positively swing said actuator and cause its shoulder to in turn positively swing said lifter downwardly into the retired position.

6. In a repeating firearm including a barrel having a cartridge chamber, a receiver at the rear end of said barrel and having a bolt-receiving passage therein extending substantially parallel to the longitudinal axis of said barrel, a breech bolt slidable in said bolt-receiving passage, a tubular magazine extending forwardly beneath said barrel and communicating at its rear end with the bolt receiving passage in said receiver in position to feed said cartridge into a position alongside the forward end of said breech bolt when the latter is in its breech closing position, and cartridge elevating means for laterally shifting cartridges from said tubular magazine into position for introduction into the cartridge chamber of said barrel by said breech bolt; said breech bolt being provided with a forwardly-facing abutment, a rearwardly-facing cam disposed forwardly of said abutment and a retaining surface disposed forwardly of said cam and extending substantially parallel with the path of movement of said breech bolt; said cartridge elevating means comprising a pivotal actuator having a shoulder and a finger, the latter being positioned with relation to said breech bolt to be sequentially engaged by the abutment, the cam and the retaining surface thereof, a pivotal cartridge lifter associated with said actuator and engageable with a cartridge to laterally shift the same from said magazine into position for introduction into the cartridge chamber of said barrel, said lifter being also engageable with said shoulder, and cartridge elevating spring means operatively interconnecting said actuator and said lifter and being constructed and arranged to yieldingly urge said lifter into engagement with said shoulder and into its cartridge elevating position when said actuator finger is engaged in sequence by the cam and the retaining surface of the breech bolt when the breech bolt is moved into its retired position; said cam being located in position to shift said actuator before the front end of said breech bolt is moved rearwardly beyond the rear end of a cartridge positioned alongside the breech bolt, to thereby energize said spring means and cause the latter to move said lifter and hence yieldingly force the cartridge against the lateral face of the breech bolt; said abutment being positioned to engage said actuator finger when the breech bolt is moved forwardly to positively swing said actuator and cause its shoulder to in turn positively swing said lifter downwardly into the retired position.

7. A tubular magazine repeating firearm including in combination: a barrel having a cartridge chamber; a receiver at the rear end of the said barrel and having a bolt receiving passage therein extending substantially parallel with the longitudinal axis of the said barrel; a breech bolt movable in the bolt receiving passage in the said receiver and provided with a forwardly facing abutment, a rearwardly facing actuating cam surface forwardly of said abutment and a retaining surface forwardly of the said actuating cam surface and extending substantially parallel with the path of movement of the said breech bolt; a tubular magazine extending forwardly beneath the said barrel and communicating at its rear end

with the bolt receiving passage in the said receiver in position to feed a cartridge into a position alongside of the forward end of the said breech bolt when the latter is in its breech closing position; and cartridge elevating means for laterally shifting cartridges from the said tubular magazine into position for introduction into the cartridge chamber of the said barrel by the said breech bolt and comprising a pivotal elevator actuating member having a stop abutment and positioned with relation to said breech bolt to be sequentially engaged by the abutment, the actuating cam surface and the retaining surface thereof, a pivotal cartridge elevating member associated with the said elevator actuating member and engageable with the stop abutment thereof and with a cartridge to laterally shift the same from the said tubular magazine into position for introduction into the cartridge chamber of the said barrel, and cartridge elevating spring means operatively interconnecting the said actuating member and the said cartridge elevating member and constructed and arranged to yieldingly urge the said cartridge elevating member into engagement with the said stop abutment and into its cartridge elevating position when the said actuating member is engaged in sequence by the actuating cam surface and the retaining surface of the said breech bolt when the said breech bolt is moved into its retired position, the actuating cam surface of the said breech bolt being located in position to shift the said elevator actuating member before the front end of the said breech bolt has moved rearwardly beyond the rear end of a cartridge positioned alongside the breech bolt, to thereby energize the said cartridge elevating spring means and cause the latter to move the said cartridge elevating member and hence yieldingly force a cartridge against a lateral face of the said breech bolt, the forwardly facing abutment of the said breech bolt being positioned to engage the said elevator actuating member when the breech bolt is moved forwardly to positively swing the said member and cause its stop abutment to in turn positively swing the said cartridge elevating member downwardly into its retired position.

8. A tubular magazine repeating firearm including in combination: a barrel having a cartridge chamber; a receiver at the rear end of the said barrel and having a bolt receiving passage therein extending substantially parallel with the longitudinal axis of the said barrel; a breech bolt movable in the bolt receiving passage in the said receiver and provided with a forwardly facing abutment, a rearwardly facing actuating cam surface forwardly of said abutment and a retaining surface forwardly of the said actuating cam surface and extending substantially parallel with the path of movement of the said breech bolt; a tubular magazine extending forwardly beneath the said barrel and communicating at its rear end with the bolt receiving passage in the said receiver in position to feed a cartridge into a position alongside of the forward end of the said breech bolt when the latter is in its breech closing position; cartridge elevating means for laterally shifting cartridges from the said tubular magazine into position for introduction into the cartridge chamber of the said barrel by the said breech bolt and comprising a pivotal elevator actuating member having a stop abutment and positioned with relation to said breech bolt to be sequentially engaged by the abutment, the actuating cam surface and the retaining surface thereof, a pivotal cartridge elevating member associated with the said elevator actuating member and engageable with the stop abutment thereof and with a cartridge to laterally shift the same from the said tubular magazine into position for introduction into the cartridge chamber of the said barrel, a cartridge cut-off finger located at the forward end of the said cartridge elevating means and having a forward surface extending substantially concentrically with respect to the pivot point of the said means; and cartridge elevating spring means operatively interconnecting the said actuating member and the said cartridge elevating member and constructed and arranged to yieldingly urge the said cartridge elevating member into engagement with the said stop abutment and into its cartridge elevating position when the said actuating member is engaged in sequence by the actuating cam surface and the retaining surface of the said breech bolt when the said breech bolt is moved into its retired position, the actuating cam surface of the said breech bolt being located in position to shift the said elevator actuating member before the front end of the said breech bolt has moved rearwardly beyond the rear end of a cartridge positioned alongside the breech bolt, to thereby energize the said cartridge elevating spring means and cause the latter to move the said cartridge elevating member and hence yieldingly force a cartridge against a lateral face of the said breech bolt, the forwardly facing abutment of the said breech bolt being positioned to engage the said elevator actuating member when the breech bolt is moved forwardly to positively swing the said member and cause its stop abutment to in turn positively swing the said cartridge elevating member downwardly into its retired position.

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