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F. F. KNOUS.
REPEATING FIREARM.
APPLICATION FILED MAR. 24, 1911.

Patented July 18, 1911.

4 SHEETS-SHEET 1

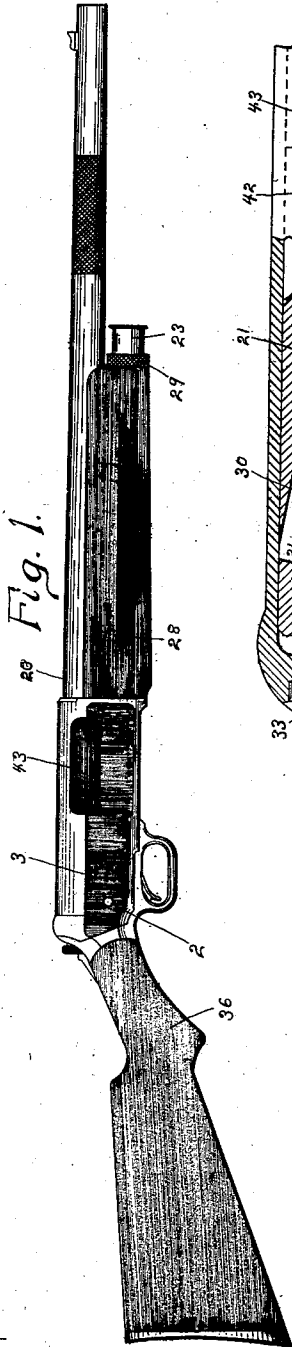


Fig. 1.

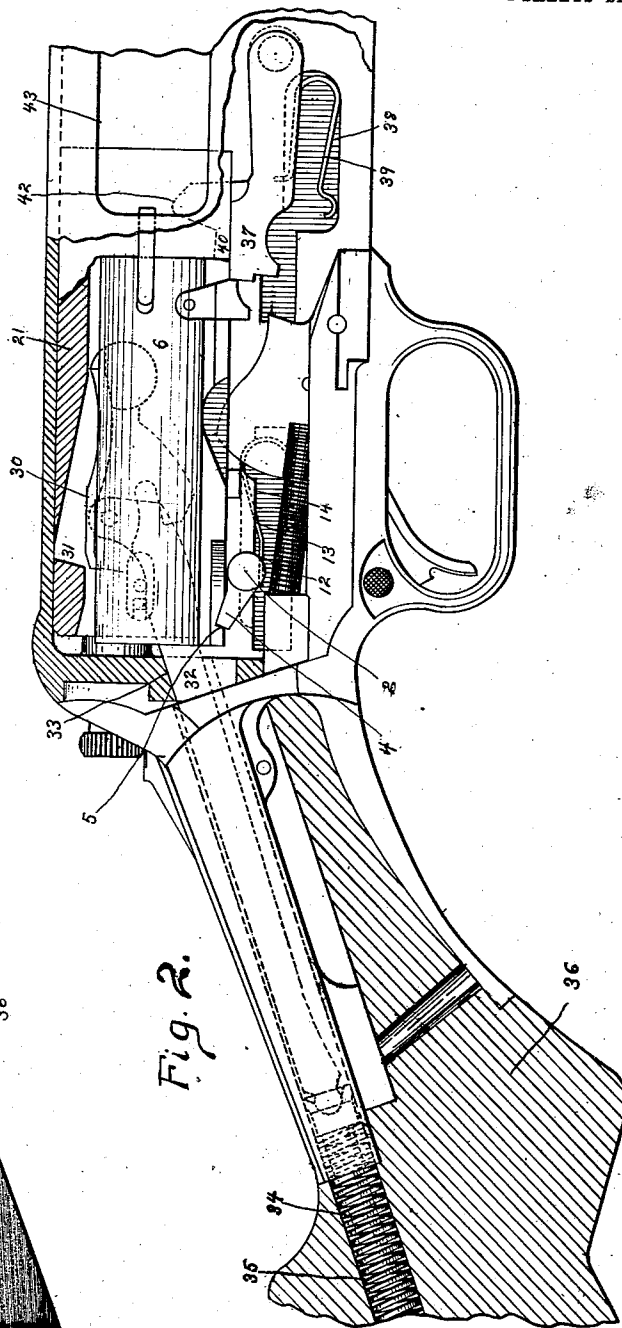


Fig. 2.

Witness
Mr. P. Michols
Albert S. Holt

Inventor
Franklin F. Knous
by Seymour T. Carey
Frederic C. Carey
Attys

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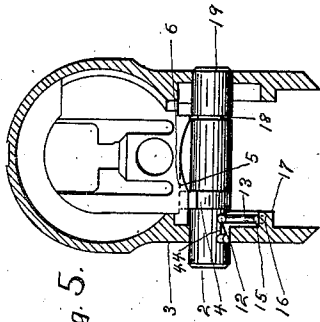


Fig. 5.

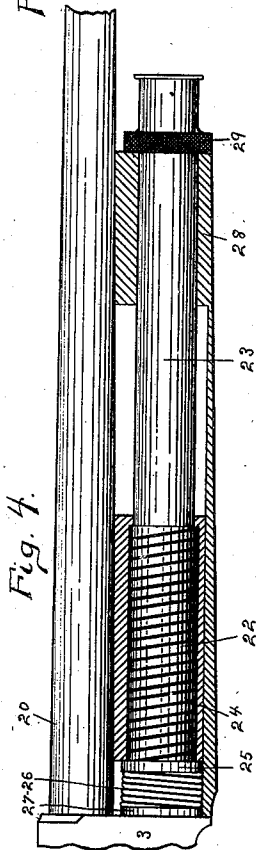


Fig. 4.

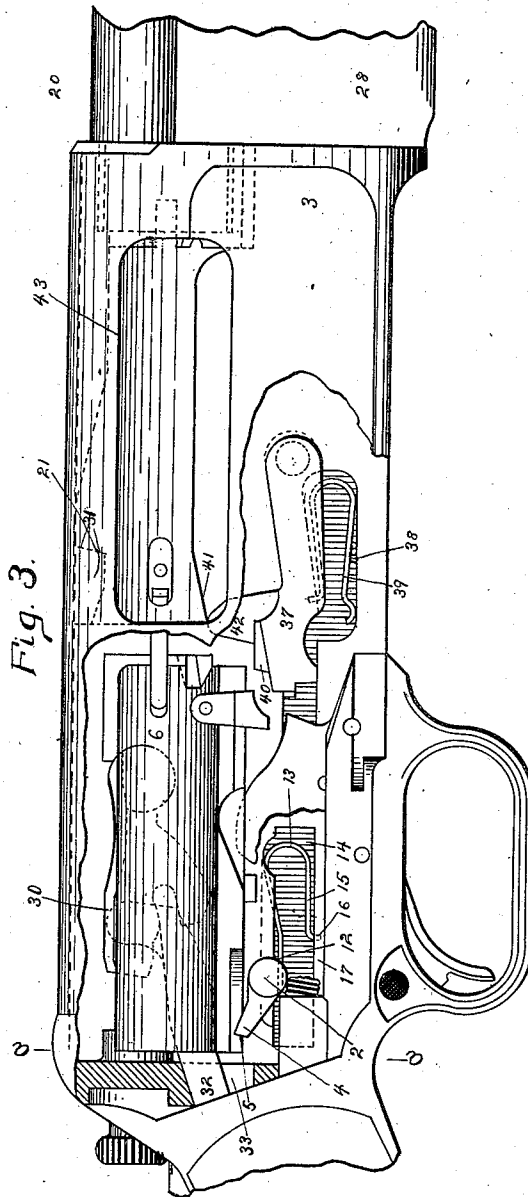


Fig. 3.

Witnesses
M. P. Nichols
Alvin P. Holt

Inventor
Franklin F. Knous
by Seymour T. Carey
Fredrick Carey
Attys

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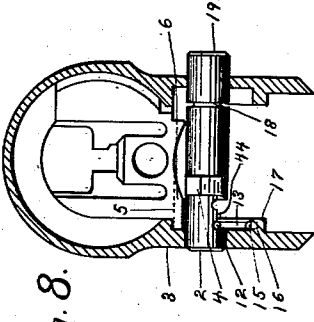


Fig. 8.

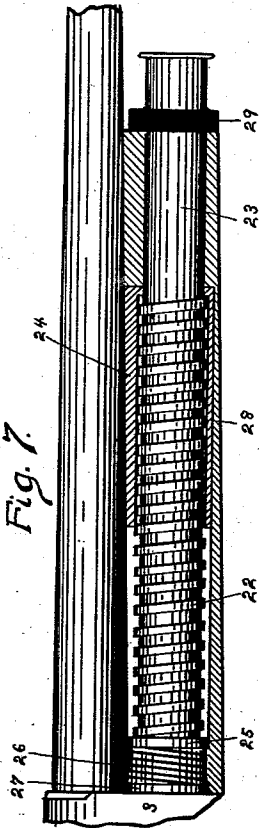


Fig. 7.

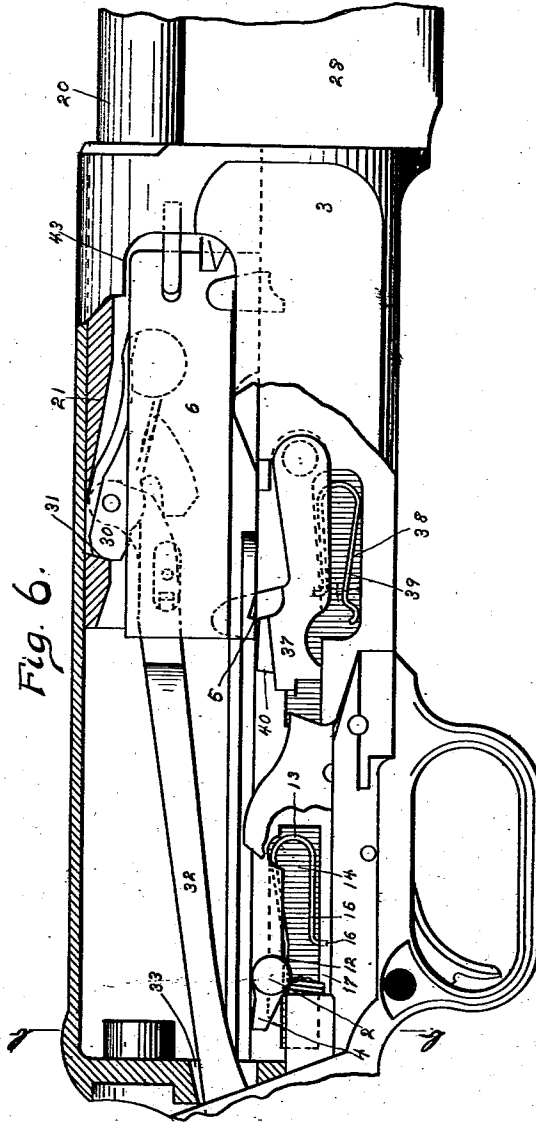


Fig. 6.

Witnesses
M. P. Nichols.
Albert S. H. H.

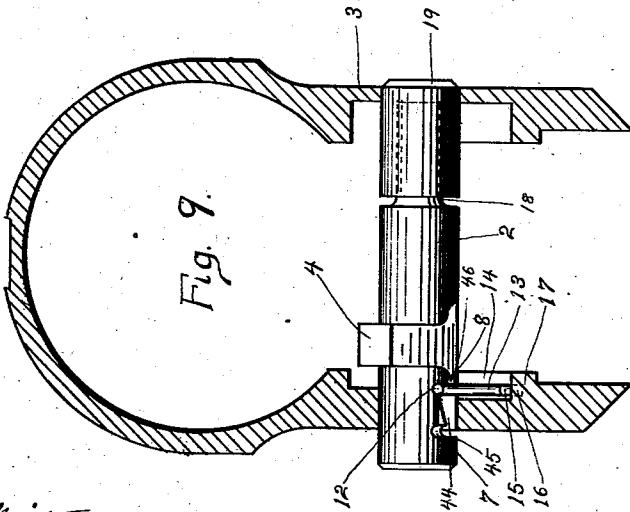
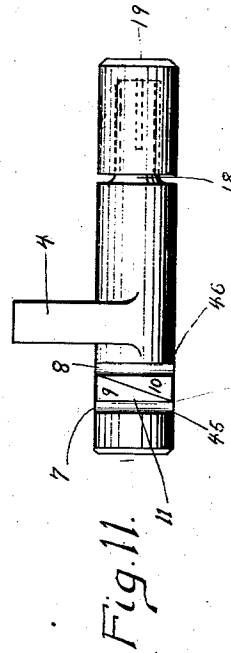
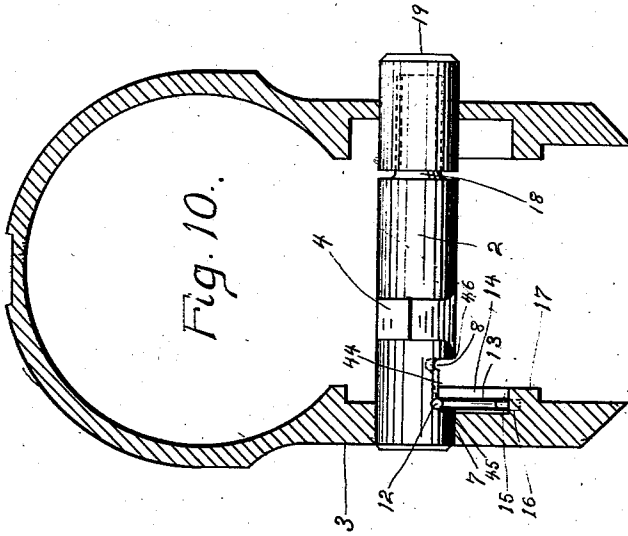
Inventor
Franklin F. Knous
by Seymour T. Carey
Frederic C. Carey
Attys

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4 SHEETS—SHEET 4.



Witnesses
M. P. Nichol
Albert H. Hols

Inventor
Franklin F. Knous
by Seymour T. Egan
Frederic C. Egan
Atty.

UNITED STATES PATENT OFFICE.

FRANKLIN F. KNOUS, OF NEW HAVEN, CONNECTICUT, ASSIGNOR TO WINCHESTER REPEATING ARMS COMPANY, OF NEW HAVEN, CONNECTICUT, A CORPORATION.

REPEATING FIREARM.

998,347.

Specification of Letters Patent. Patented July 18, 1911.

Application filed March 24, 1911. Serial No. 616,734.

To all whom it may concern:

Be it known that I, FRANKLIN F. KNOUS, a citizen of the United States, residing at New Haven, in the county of New Haven and State of Connecticut, have invented a new and useful Improvement in Repeating Firearms; and I do hereby declare the following, when taken in connection with the accompanying drawings and the letters of reference marked thereon, to be a full, clear, and exact description of the same, and which said drawings constitute part of this specification, and represent, in—

Figure 1 a view in side elevation of a self-loading tubular magazine repeating shot-gun constructed in accordance with my invention. Fig. 2 a broken view of the gun in vertical longitudinal section, showing the breech-bolt and barrel-extension in their rearward and open positions with the bolt held at its forward end by the bolt-stop, but with the bolt-catch in readiness to take the place of the bolt-stop when the same is depressed by the cam on the barrel-extension just as the same reaches the limit of its forward movement. Fig. 3 a corresponding view showing the barrel-extension moved forward into its closed position and the breech-bolt held in its rearward and open position by the bolt-catch. Fig. 4 a broken view partly in vertical longitudinal section and partly in side elevation, showing the gun-barrel, the forearm, the barrel-closing spring and the buffer-spring, the springs being shown compressed. Fig. 5 a view in vertical transverse section on the line *a-a* of Fig. 3, looking forward and showing the bolt-catch holding the bolt. Fig. 6 a broken view in vertical longitudinal section corresponding to Figs. 2 and 3, but showing the barrel-extension and breech-bolt in their forward and firing positions. Fig. 7 a view corresponding to Fig. 4 but showing the barrel in its forward position into which it is moved by the barrel-closing spring. Fig. 8 a view in vertical transverse section on the line *b-b* of Fig. 6, showing the bolt-catch in its bolt-releasing position. Fig. 9 a broken view in vertical transverse section on an enlarged scale, showing the bolt-catch in position to be engaged by the bolt. Fig. 10 a corresponding view showing the bolt-catch in its retired position in which it clears the bolt. Fig. 11 a detached reverse

plan view of the bolt-catch on the scale of Figs. 9 and 10.

My invention relates to an improvement in self-loading tubular magazine repeating shotguns, the object being to produce a simple, compact, reliable and durable arm constructed with particular reference to adapting it to be used as a single loader without the manual opening of the gun by the retraction of the barrel.

With these ends in view my invention consists in a firearm having certain details of construction and combinations of parts as will be hereinafter described and pointed out in the claims.

In carrying out my invention as herein shown, I employ a rod-like or cylindrical bolt-catch 2 having its respective ends journaled in the side walls of the gun-frame or receiver 3 near the rear end thereof, the said catch being adapted to have endwise movement in a line at a right angle to the longitudinal axis of the gun, as well as to have a very slight rocking or oscillating movement upon its trunnion-like ends for the purpose of raising and lowering its rearwardly extending beveled nose 4 with respect to a forwardly inclined notch 5 formed close to the rear end of the lower face of the breech-bolt 6. For the purpose of automatically rocking the bolt-catch 2 upon its longitudinal axis and for holding it at the limits of its oscillating movement, I form in the lower face of its left hand end two parallel shallow semi-circular grooves 7 and 8 extending clear across it transversely, and separated from each other by angular cam-surfaces 9 and 10 joined by a diagonally arranged rib 11 clearly shown in Fig. 11. These grooves 7 and 8 alternately receive the upwardly inclined straight rear end of the upper arm 12 of a bent wire bolt-catch spring 13 arranged in a vertical plane in a recess 14 in the inner face of the left hand side wall of the gun-frame or receiver 3, the lower arm 15 of the said spring being bent downward at its extreme rear end and inserted into a hole 16 formed in a rib 17 upon the inner face of the said left hand wall of the frame 3. The said upper arm 12 of the spring 13, exerts a constant upward pressure upon the bolt-catch 2 so that when the same is moved lengthwise, the said arm rides over the cam-surfaces 9 and 10 with the

effect of exerting an effort to push the bolt-catch in one direction or the other as the case may be. In this way the said cams give a certain snappiness and quickness of movement to the bolt-catch after the same has been initially started moving in one direction or the other for the shifting of the spring-arm 12 from the groove 7 to the groove 8 and vice versa, the said arm 12 being always located in one groove or the other for holding the catch in either one or the other of its two extreme positions except during the brief interval when it is riding over the cam-surfaces 9 and 10. The said grooves 7 and 8 are located at the ends of the bottom wall of a transverse cut 44 formed in the bolt-catch 2 the lengthwise movement of which is limited by the engagement of the said arm 12 with the end walls 45 and 46 of the said cut 44 as clearly seen in Figs. 9 and 10.

Now in order to cause the bolt-catch during its lengthwise movement, to oscillate just enough to raise and lower its nose 4 for co-action with or clearance from the breech-bolt 6, the grooves 7 and 8 are tilted or inclined with respect to each other at an angle sufficient to produce the required oscillating movement, the inner groove 8 being higher at its forward end than the forward end of the outer groove 7. In other words, while the rear ends of the two grooves are in the same horizontal plane, the grooves are tilted so that the forward end of the inner groove is higher than the forward end of the outer groove. On account of its provision with the nose 4, the bolt-catch 2 must be constructed so as to permit it to be assembled in the frame 3. For this purpose one of its ends consists, as shown, of a split threaded stem 18 receiving a threaded cap 19 forming the right hand trunnion end of the catch.

When the gun is being used as a repeating arm, the bolt-catch is pushed from left to right and held in its retired position by the engagement of the arm 12 of the spring 13 with the outer groove 7 in the lower face of the catch, the beveled nose 4 which is at this time depressed below the path of travel of the lower face of the breech-bolt 6 and also moved inward out of the range of the notch 5 in the lower face of the bolt 6. The bolt-catch being thus retired, the gun operates as a repeating arm as follows: When the gun is fired, the breech-bolt 6, the gun-barrel 20 and the barrel-extension 21 recoil as one piece and compress the barrel-closing spring 22 encircling the rear end of the magazine 23 and made just long enough to be entirely housed, when compressed, in a sleeve 24 depending from the barrel 20 so that at the limit of the rearward movement of the barrel, the rear end of the sleeve 24 abuts against a sliding washer 25 mounted upon

the magazine 23 and placed against the forward end of a buffer-spring 26 the rear end of which is abutted against a corresponding washer 27 also encircling the magazine 23 and abutted against the forward face of the gun-frame or receiver 3. It is to be particularly noted, that the spring 22 and sleeve 24 are constructed and proportioned in length so that the rear end of the sleeve 24 is engaged with the washer 25 to bring the buffer 26 into play, before the spring 22 has reached the limit of extreme compression. The parts just described are located within a chambered forearm 28 from the forward end of which the magazine projects, its forward end being furnished with an integral knurled operating shoulder 29.

During the rearward movement of the breech-bolt 6, gun-barrel 20 and barrel-extension 21, as above described, the barrel-extension 21 is locked to the breech-bolt 6 by means of a locking-block 30 pivotally mounted in the breech-bolt and at this time lifted into the locking-notch 31 in the barrel-extension. Just before the bolt 6, barrel 20 and barrel-extension 21 reach the limit of their rearward excursion, the said locking-block 30 is drawn downward out of the said locking-notch 31 by means of the bolt push-rod 32 which is pivotally connected to the said pivotal locking-block 30 and extends downward and outward through an inclined opening 33 in the rear wall of the gun-frame or receiver 3, the inclined upper face of the said opening 33 acting as a cam to depress the rod 32, and hence draw the pivotal block 30 downward out of the locking-notch 31. During the rearward movement of the bolt 6, its said rod 32 effects the compression of a bolt-returning spring 34 housed in a chamber 35 in the butt-stock 36. Just before the bolt, barrel and barrel-extension reach the limit of their rearward movement, the block 30 is cleared from the notch 31 and the barrel and barrel-extension released to the action of the now compressed barrel-closing spring 22 which at once asserts itself to return the barrel and barrel-extension to their closed positions which is the limit of their forward movement; but the bolt is meanwhile held at the limit of its rearward movement by a bolt-stop 37 located in a recess 38 in the left hand side wall of the gun-frame or receiver 3, and swinging in a vertical plane upon its forward end as upon a center. A spring 39 also located in the recess 38 acts upon the stop 37 so as to continually press it upward. When the bolt 6 reaches the limit of its rearward movement, a lug 40 upon the rear end of the stop rises in front of the forward end of the bolt and prevents the same from being moved forward under the tension of the bolt-closing spring 34. However, just before the barrel and barrel-extension reach the limit

of their forward movement under the action of the spring 22, a cam-surface 41 upon the barrel-extension 21 engages with a cam 42 upon the bolt-stop 37 and forces the same downward so as to disengage the lug 40 from the forward end of the bolt 6 which is then permitted to be moved forward into its closed position by the bolt-closing spring 34.

In case it is desired to use the gun as a single loader, the bolt-catch 2 is moved from right to left, whereby the arm 12 of the spring 13 is jumped, as it were, over the outer groove 7 to the inner groove 8 and whereby the catch 2 is rotated on its longitudinal axis and its nose 4 swung up into position to enter the notch 5 in the breech-bolt 6, but the end of the nose 4 does not come into contact with the rear wall of the said notch 5 until the barrel and barrel-extension have moved forward into their closed positions, and thus effected the depression of the bolt-stop 37 after which the stopping of the bolt is shifted, as it were, from the bolt-stop 37 to the nose 4 of the bolt-catch 2 which then holds the bolt in its retracted position. The gun being open, a single cartridge is inserted by hand into the ejection-opening 43 in the right hand wall of the gun-frame or receiver 3. The bolt-catch is now manually pushed from left to right to release the bolt 6 which is immediately pushed forward by the spring 34 into its closed position after which the catch must be again moved from right to left so as to be in readiness to catch and hold the bolt 6 when the gun is fired. Now although the gun is being used as a single loader, the user is relieved of the manual exertion of opening the gun by taking hold of the barrel and drawing it back against the tension of the barrel-closing spring 22 and the bolt-closing spring 34, for the reason that he is utilizing the recoil for opening the gun and compressing the two springs 22 and 34, being able to thus utilize the force of recoil by the provision of the gun with the bolt-catch 2 which he must move from right to left before the gun is fired, then from left to right to release the bolt to permit the same to move into its closed position, and then from right to left to bring the catch into position to catch the bolt and hold the same in its open position preparatory to loading another cartridge into the gun. I wish to particularly point out that the bolt-

catch 2 is located at a right angle to the longitudinal axis of the gun and therefore is itself practically unaffected by the shock of recoil.

I claim:—

1. In a repeating firearm, the combination with a recoiling breech-bolt, of a manually operable bolt-catch for holding the bolt in its open position, and a spring for oscillating the catch for moving the same into and out of engagement with the bolt.

2. In a repeating firearm, the combination with a recoiling breech-bolt, of a manually operable bolt-catch movable lengthwise at a right angle to the longitudinal axis of the gun and oscillating during its lengthwise movement to permit it to coact with or clear the bolt, and a spring for controlling the movement of, and oscillating the catch when the same is moving.

3. In a repeating firearm, the combination with a recoiling breech-bolt, of a manually operable bolt-catch provided with a nose and movable lengthwise at a right angle to the longitudinal axis of the gun and oscillating to raise and lower its nose with respect to the said breech-bolt, and a spring co-acting with the catch to limit its endwise movement and control its oscillation.

4. In a repeating firearm, the combination with the frame thereof, of a recoiling breech-bolt, a manually operable bolt-catch made in sections to permit it to be assembled in the said gun-frame and provided with a nose for co-action with the said bolt, and a spring co-acting with the said catch and effecting oscillating movement thereof.

5. In a repeating firearm, the combination with the gun-frame or receiver thereof, of a recoiling breech-bolt, and a manually operable bolt-catch having a nose for co-acting with the said bolt and formed with two grooves inclined with respect to each other and separated by a cam-face, and a spring co-acting with the said grooves to oscillate the catch to shift the position of its nose with respect to the said bolt.

In testimony whereof, I have signed this specification in the presence of two subscribing witnesses.

FRANKLIN F. KNOUS.

Witnesses:

THOMAS C. JOHNSON,
DANIEL H. VEADER.