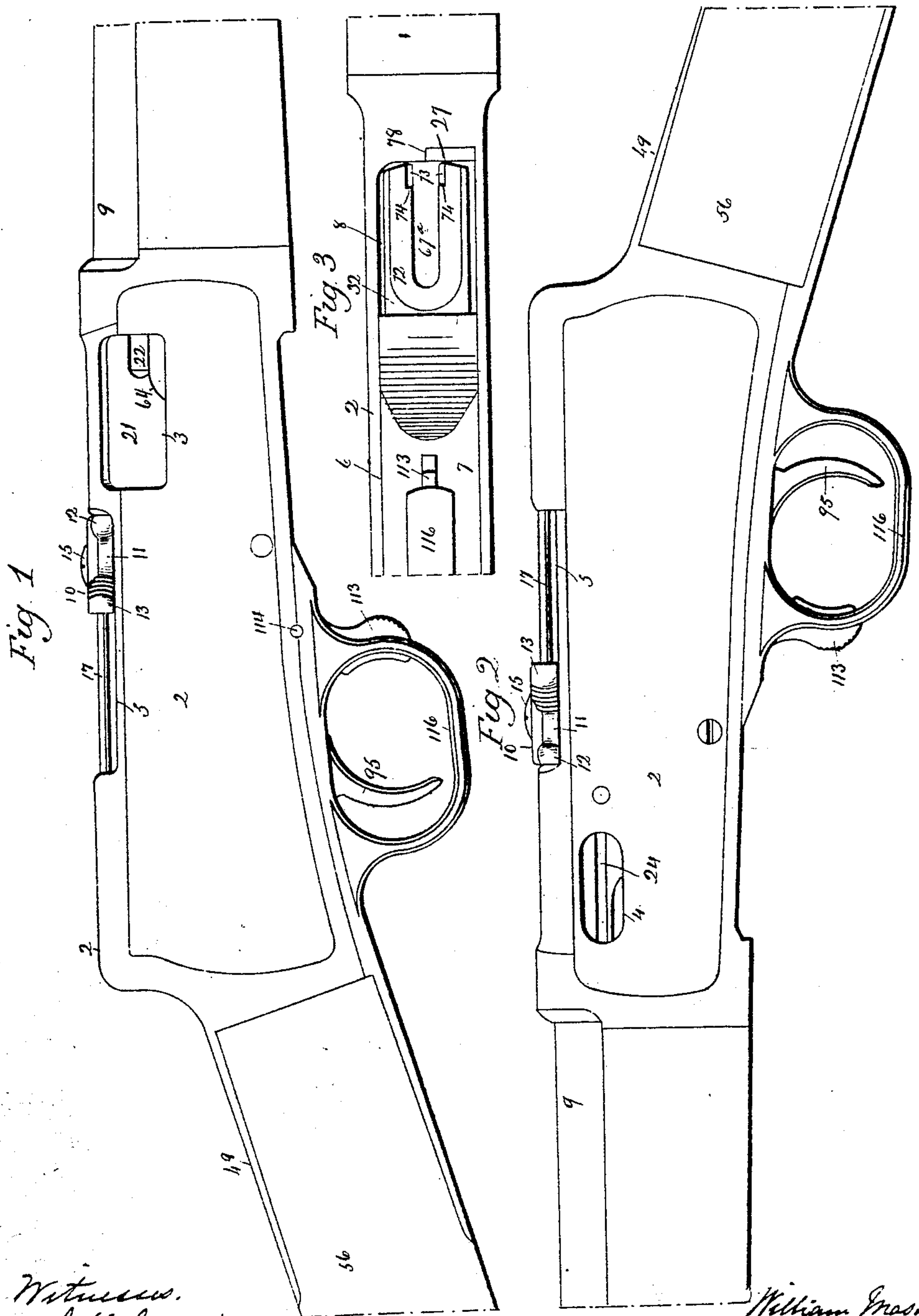


No. 846,591.

PATENTED MAR. 12, 1907.

W. MASON.
AUTOMATIC FIREARM.
APPLICATION FILED MAR. 20, 1905.

4 SHEETS—SHEET 1.



Witnesses.
J. H. Shumway
Clara L. Reed.

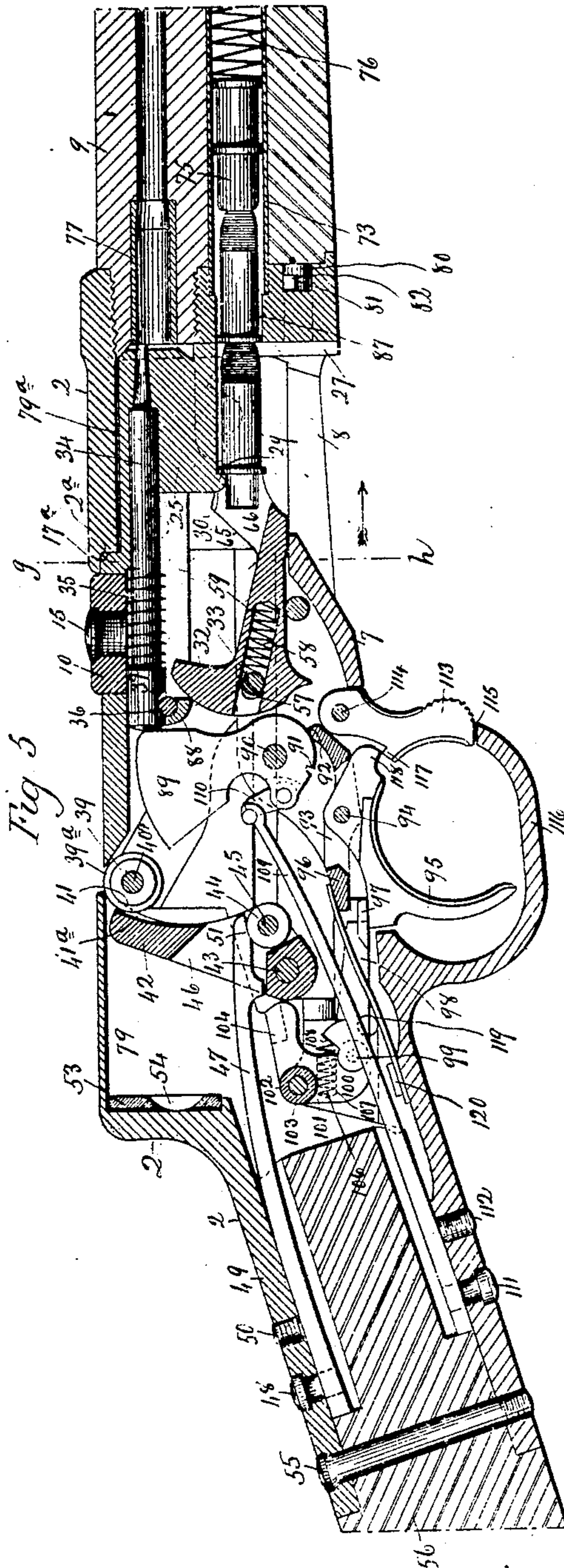
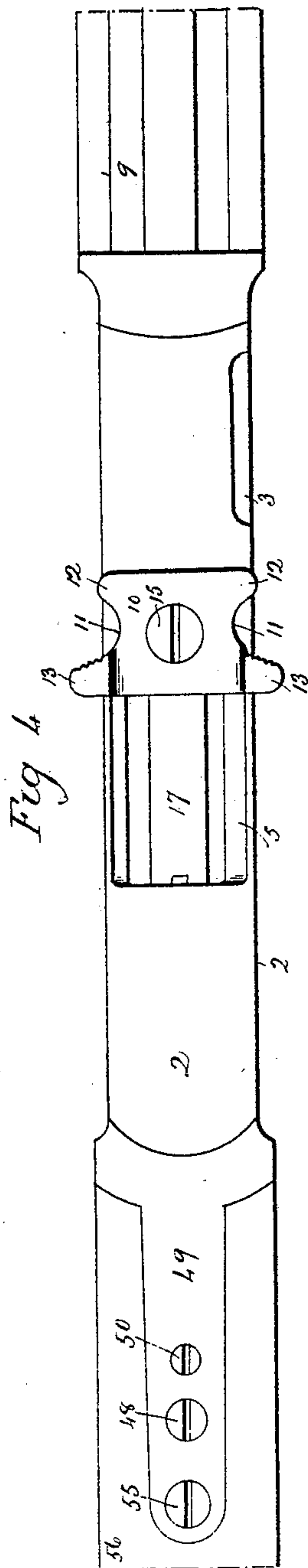
William Mason.
Inventor.
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No. 846,591.

PATENTED MAR. 12, 1907.

W. MASON.
AUTOMATIC FIREARM.
APPLICATION FILED MAR. 20, 1905.

4 SHEETS—SHEET 2.



Witnesses.
J. H. Shannon
Clara L. Weed.

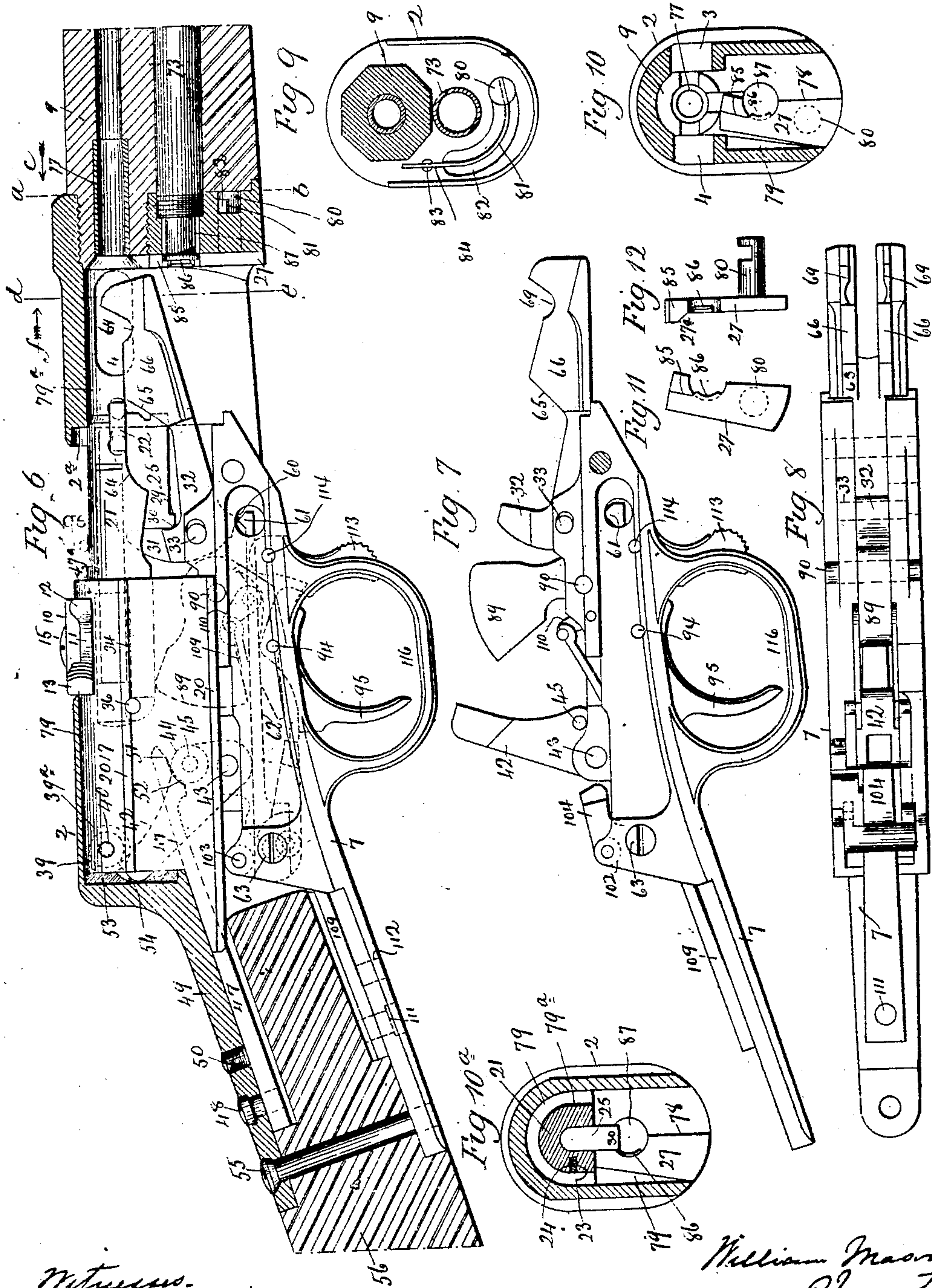
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No. 846,591.

PATENTED MAR. 12, 1907.

W. MASON.
AUTOMATIC FIREARM.
APPLICATION FILED MAR. 20, 1905.

4 SHEETS—SHEET 3.



Witness.
J. H. Shumway
Clara L. Weed.

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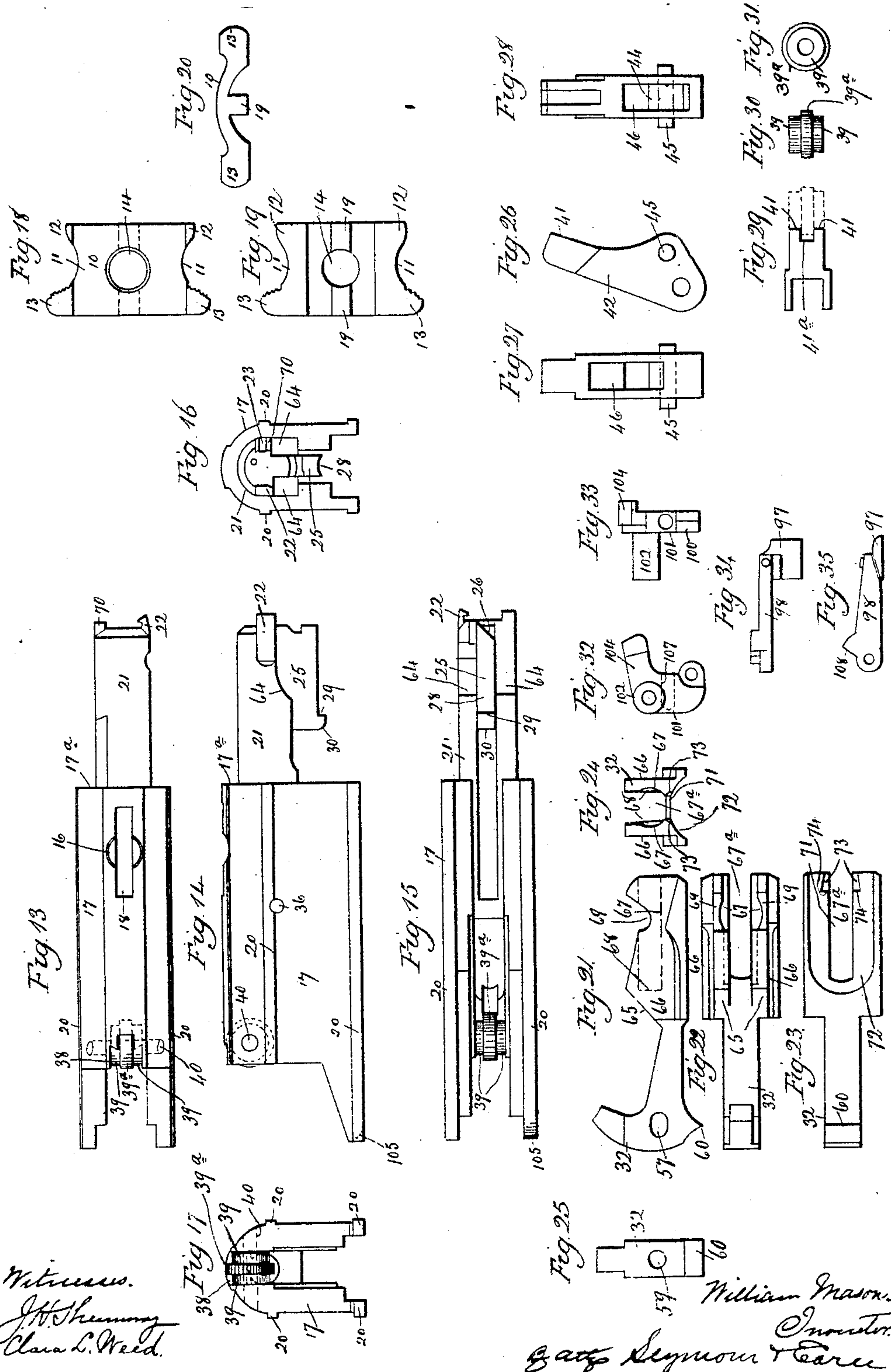
Draftsman

No. 846,591.

W. MASON.
AUTOMATIC FIREARM.
APPLICATION FILED MAR. 20, 1905.

PATENTED MAR. 12, 1907.

4 SHEETS—SHEET 4.



UNITED STATES PATENT OFFICE.

WILLIAM MASON, OF NEW HAVEN, CONNECTICUT, ASSIGNOR TO WINCHES-
TER REPEATING ARMS CO., OF NEW HAVEN, CONNECTICUT, A CORPO-
RATION.

AUTOMATIC FIREARM.

No. 846,551.

Specification of Letters Patent.

Patented March 12, 1907.

Application filed March 20, 1905. Serial No. 250,932.

To all whom it may concern:

Be it known that I, WILLIAM MASON, 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 Automatic 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 broken view in right-hand side elevation of my improved automatic firearm; Fig. 2, a corresponding left-hand side view of the arm; Fig. 3, a broken reverse plan view of the arm to show the loading-opening in the bottom of the gun-frame and the longitudinal finger-opening in the cartridge-carrier; Fig. 4, a broken plan view of the gun; Fig. 5, a broken view of the gun in vertical longitudinal section, showing the positions of its several parts when it is closed; Fig. 6, a corresponding view of the gun with the parts in the positions they have when it is open; Fig. 7, a detached view in side elevation of the lower tang of the gun with the several parts mounted therein; Fig. 8, a plan view thereof; Fig. 9, a view in transverse section on the line *a b* of Fig. 6 looking in the direction of the arrow *c*; Fig. 10, a corresponding view on the line *d e* of the same figure looking in the direction of the arrow *f*; Fig. 10^a, a corresponding view on the line *g h* of Fig. 5 looking in the direction of the arrow *i*; Fig. 11, a detached view in rear elevation of the cartridge-gate; Fig. 12, a detached edge view thereof; Fig. 13, a detached plan view of the breech-block; Fig. 14, a view thereof in right-hand side elevation; Fig. 15, a reverse plan view thereof; Fig. 16, a view thereof in front elevation; Fig. 17, a view thereof in rear elevation; Fig. 18, a detached view of the breech-block handle; Fig. 19, a reverse plan view thereof; Fig. 20, a view thereof in rear elevation; Fig. 21, a detached view in side elevation of the cartridge-carrier; Fig. 22, a plan view thereof; Fig. 23, a reverse plan view thereof; Fig. 24, a view thereof in front elevation; Fig. 25, a view thereof in rear elevation; Fig. 26, a detached view in side elevation of the breech-block lever; Fig. 27, a view thereof in front elevation; Fig. 28, a view

thereof in rear elevation; Fig. 29, a plan view thereof with the three antifriction-rollers indicated by broken lines; Fig. 30, a detached plan view of the rollers, shown as separated; Fig. 31, a detached view of the rollers in side elevation; Fig. 32, a detached view in side elevation of the timing-lever; Fig. 33, a view thereof in front elevation; Fig. 34, a plan view of the timing-piece; Fig. 35, a view thereof in side elevation.

My invention relates to an improvement in that class of automatic firearms in which the extraction and ejection of the spent shell, the recocking of the hammer, and the loading of a cartridge into the gun-barrel is effected by the breech mechanism acting under the influence of the gases of explosion, the object being to produce a simple, compact, safe, effective, and convenient arm.

With these ends in view my invention consists in an automatic 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 gun-frame or receiver 2, having an ejection-opening 3 in the forward end of its right-hand wall, a gas-escape opening 4 in the forward end of its left-hand wall, a handle-opening 5, occupying the middle portion of its crowning top and its bottom cut away except for a short distance at its extreme forward end to form an opening 6 for the reception of the lower tang 7, and a cartridge-loading opening 8, which is in reality a continuation of the tang-opening 6, but for convenience described as a separate opening because it constitutes, in effect, an opening or passage into the frame 2 when the lower tang is in place in the opening 6. The ejection-opening 3 and the gas-escape opening 4 are located directly opposite each other, forming, as it were, a transverse passage through the forward end of the gun-frame. The said gas-escape opening 4 is so constructed and arranged with reference to the construction and arrangement of the breech-block 17 that it permits the escape of gas through it when the breech-block is in its closed position, so that in case there should be a leakage of gas due, for instance, to the splitting of the head of a cartridge the gas will work back and escape through the said opening 4 without damage to the gun, whereas in the absence of

such a gas-escape opening, the breech-block might be broken or deformed by the force of the gas bending it from left to right toward the ejection-opening 3. With respect to the
5 said handle-opening 5, it is located to the rear of the rear ends of the ejection-opening 3 and the gas-escape opening 4, the forward ends of which extend forward in close proximity to the rear end of the gun-barrel 9.
10 The top of the gun-frame or receiver 2 is therefore left solid at a point over the ejection-opening 3 and the gas-escape opening 4 and over the forward end of the breech-block 17 when the same is in its closed position.

15 At its rear end the gun-frame is closed to form at the rear end of its main chamber 79 a recoil or abutment-shoulder for the breech-block 17, which is of the so-called "balanced" type—that is to say, it is a breech-block
20 which is not positively locked in its closed and recoil-taking position but weighted with reference to the energy developed by the explosion of the cartridge to be used in the gun, so that its inertia takes the initial
25 shock of recoil. My improved gun therefore belongs in the class of automatic balanced breech-block guns.

For manually opening the gun preparatory to firing the first cartridge or in case of a mis-
30 fire or when it is desired to unload the gun by withdrawing a loaded cartridge from the gun-barrel 9, I employ a breech-block handle 10, Figs. 4, 18, 19, and 20, arranged transversely with respect to the top of the gun-frame 2
35 and in length exceeding the width thereof. The ends of this handle are formed with finger-cuts 11, flanked at their forward ends by ears 12 and at their rear ends by knurled or roughened fingers 13, extending outwardly
40 beyond the planes of the side walls of the frame 2, so as to be readily engaged by the finger and thumb, respectively. The said handle is also formed with a centrally-arranged screw-hole 14, receiving a screw 15,
45 entering a screw-hole 16 in the forward end of a longitudinally-reciprocating non-rotatable balanced breech-block 17. The said screw-hole 16 is bisected, as it were, by a longitudinal slot 18, the ends of which respectively re-
50 ceive two lugs 19, depending from the center of the lower face of the handle and located on opposite sides of the screw-hole 14 therein; whereby the handle is rigidly connected with the breech-block 17. The upper face of the
55 handle 10 is convexed and its lower face concaved, Fig. 20, to conform to the rounding top of the gun-frame 2 and the rounding top of the breech-block 17. The rounding top of the breech-block rises, as it were, into the
60 opening 5 in the gun-frame and completely closes the said opening when the gun is closed. The said breech-block 17 is formed upon its sides with bearing-ribs 20, which bear upon the inner faces of the side walls of
65 the gun-frame 2. At its forward end the

block has a bolt-like extension or closure 21, considerably smaller in its transverse dimensions than the transverse dimensions of the main body of the breech-block and fitting
70 into and sliding back and forth in a secondary chamber 79^a, formed at the forward end of the main chamber 79 of the gun-frame by thickening the rounding top thereof and the side walls thereof at the upper forward corner thereof, so as to form a reinforce, the rear
75 end of which forms a shoulder 2^a corresponding to the shoulder 17^a, formed between the rear end of the closure 21 and the forward end of the main body of the breech-block. The said chamber 79^a is very much smaller
80 than the main chamber 79, and therefore better confines and controls the spent cartridge-shells as they are extracted from the gun-barrel. The said extension or closure is provided on its right-hand side with a spring-
85 actuated extractor-hook 22 of ordinary construction and has a long ejector-slot 23 formed in its left-hand side for the reception of a fixed leaf-like ejector 24, Fig. 10^a, projecting inwardly from the left-hand wall of the gun-
90 frame. A longitudinally-arranged arm 25, depending from the closure 21 aforesaid, is obliquely cut away at its forward end to form a wedge 26 for the operation of the cartridge-gate 27, Figs. 9, 10, 10^a, 11, and 12, to
95 be described later on. The lower edge of the arm 25 is formed with a cartridge-receiving groove 28, flanked at its rear end by a cartridge-stop shoulder 29, back of which the arm is formed with a cam-face 30, which be-
100 fore the block reaches its open position engages with the upwardly-projecting operating-arm 31 of the cartridge-carrier 32 and swings the same on its pivot 33 from its depressed or cartridge-receiving to its elevated
105 or cartridge-delivering position. A firing-pin 34, mounted in the said breech-block, is encircled by a firing-pin spring 35 and limited in endwise play by a stop-pin 36, entering a short slot 37, formed in the lower face of the
110 rear end of the pin.

In the upper corner of its rear end the breech-block 17 is formed with a cut 38 for the reception of three antifriction-rollers 39, 39, and 39^a, Figs. 30 and 31, mounted on a
115 pin 40, on which they are free to turn independently. The middle roller 39^a, which is larger in diameter than the end rollers 39 39, is adapted to ride upon the inner face of the rounding top of the gun-frame 2 and reduces
120 the friction of the operation of the block, which as it moves back and forth causes the said roller to be reversed in the direction of its rotation. The said end rollers 39 39 are respectively engaged with curved bearing-
125 faces 41 41, formed in the upper end of a breech-block lever 42 and separated from each other by a groove 41^a, receiving and clearing the said middle roller 39^a, which is thus left to turn in either direction free of all
130

restraint from the said lever, while, on the other hand, the rolling of the end-rollers 39 on the bearing-faces 41 is not restrained by the coaction of the roller 39^a with the gun-frame 2. The said lever 42, Figs. 26, 27, 28, and 29, is hung upon a pivot 43 in the lower tang 7 of the gun, carries an antifriction-roller 44, turning on a pin 45, and is formed with a large opening 46, through which the roller 44 is engaged by the forward end of a flat breech-block spring 47, the rear end of which is secured by a screw 48 to the upper tang 49, which consists of an integral rearward extension of the gun-frame 2. A screw 50, located in the tang 49 in position to engage with the spring 47, regulates the tension thereof. Under this construction the flat spring 47 exerts a constant effort through the said lever 42 and through the antifriction-rollers 39 to push the breech-block 17 forward into its closed position. When in this position, a bevel 51 at the forward end of the spring 47 engages with the antifriction-roller 44 at a point back of the vertical center thereof and above the axis thereof, and therefore so as to exert an effort to swing the said lever forward and downward, whereby its upper end is crowded against the said roller 39, so as to exert a constant effort to hold the breech-block 17 in its closed position, as shown by Fig. 5. On the other hand, when the gun is open, as shown by Fig. 6, the said roller 44, although not engaged with the said bevel 51, is engaged by a point in the concaved bearing-face 52 of the forward end of the spring, which acts immediately to return the breech-block into its closed position. As shown, I employ a buffer 53, of vulcanized fiber, located at the rear end of the main chamber 79 in the gun-frame and engaged by the rear end of the breech-block when the same reaches the limit of its rearward excursion. This buffer is formed with a recess 54 to clear the upper end of the lever 42 when the same is rocked back when the gun is opened. A screw-bolt 55, passing through the upper tang 49 and the rear end of the lower tang 7 and through the forward end of the stock 56, secures the said parts together. The lever 42, when constructed and arranged as described, enables me to employ a flat bolt-spring and secure a marked economy of space.

The cartridge-carrier 32, which swings upon a pivot 33, is formed for the reception thereof with an elongated pivot-hole 57, extending lengthwise with the carrier and endowing the same with a capacity for slight longitudinal movement against the tension of a coiled spring 58, located in a spring-chamber 59 in the form of a deep hole entering the rear end of the carrier and intersecting the elongated pivot-hole 57, the said spring being located between the bottom of the hole 57 and the forward face of the pivot 33.

This construction permits the entire carrier to move rearward slightly under the shock caused by the impingement of the cam-face 30 against the carrier-arm 31 when the breech-block 17 recoils.

At its rear end the carrier 32 is formed with a depending nose 60, coacting with a doubly-beveled lug 61, located upon the upper face of the extreme forward end of a flat carrier-spring 62, located within the chambered lower tang 7 and secured to the right-hand side wall thereof by means of a screw 63 passing through the extreme rear end of the said spring. When the breech-block recoils, the cam-face 30 strikes the carrier-arm 31 with sufficient force to overcome the tension of the carrier-spring 62 and cause the nose 60 of the carrier to ride from the rear to the forward face of the lug 61 thereof, the carrier being lifted to its cartridge-delivering position, from which, however, it is free to drop into its intermediate or cartridge-loading position on account of the play between the forward face of the lug 61 and the said nose 60. In the forward movement of the breech-block 17 the bevels 64 of the closure 21 engage with the bevels 65 of the carrier, whereby the tension of the spring 62 is again overcome and the nose 60 caused to ride from the forward to the rear face of the lug 61, after which the said spring holds the carrier in its depressed or cartridge-receiving position. When the gun is loaded, the carrier is manually swung upward into its intermediate or cartridge-loading position by pressing upward on its lower face with sufficient force to overcome the tension of the spring 62 and cause the nose 60 to ride over the lug 61.

The inner faces of the side flanges 66 at the forward end of the carrier 32 are formed with corresponding concave cartridge-receiving grooves 67, which combine to form a cartridge-chamber 67^a, and the rear walls 68 of which combine to form a cartridge-stop. Near their forward ends the flanges 66 are formed with transverse clearance-notches 69 for the clearance, respectively, of the extractor 22 and the integral fingers 70, located opposite the extractor and respectively arranged above and below the ejector-slot 23, formed in the left-hand side of the bolt-like closure 21, as already described. Under this construction and arrangement the ejector 24 passes back and forth between said fingers 70, which support the head of the shell against the thrust of the hook of the extractor 22, and by their position, as explained, above and below the path of the ejector 24 determine the expulsion of the shell from left to right in a horizontal plane passing through the axis of the gun-barrel. The said flanges 66 are separated by a centrally-arranged longitudinal finger-opening 71, around which the lower face of the carrier is

recessed, as at 72, to facilitate the access of the finger to the said opening 71.

At the extreme forward end of the carrier 32 its lower face is cut away to form two notches 73, the rear walls 74 of which act together to form a loading-shoulder, which may or may not be used, as desired. When this loading-shoulder is used, the sportsman passes a cartridge up through the loading-opening 8 of the gun-frame and introduces it into the rear end of the hole 87, leading into the tubular magazine 73, having previously pushed the carrier upward against the tension of its spring into its intermediate or cartridge-loading position. Supposing that there are now no cartridges in the magazine, the nose of the cartridge will be engaged with the follower 75 therein and push the said follower forward in the tube 73 against the tension of the magazine follower-spring 76. As soon as the head of the cartridge has been pushed forward of the said loading-shoulder formed by the walls 74 the head end of the cartridge is slightly elevated by the sportsman, who also at the same time slightly lets up on his forward end thrust upon the cartridge, whereby the spring 76 will at once act to push the cartridge rearward until its head is engaged with the said shoulder, after which the cartridge-carrier 32 will be held in its loading position by the partly-loaded cartridge. Another cartridge is now fed into the gun, so as to take the place of the first cartridge. The second cartridge in turn is utilized to hold the cartridge-carrier in its loading position, and so on until the magazine has been filled. The finger-opening 71 affords clearance for the cartridges as they are being loaded and facilitates the loading operation. In case a cartridge has been fed out of the magazine 73 into the chamber 67^a of the cartridge-carrier it may be pushed back into the magazine by engaging its head from below through the finger-opening.

The cartridges are fed into the chamber 67^a, when the carrier is in its depressed position, from which the carrier is lifted into its elevated position by the breech-block, when the same moves back into its open position. Then when the breech-block moves forward the forward edge of the arm 25 of the closure 21 will engage with the head of the cartridge and push the same forward into a bushing 77, located, as shown, in the breech end of the gun-barrel 9, but not necessarily employed. It should be explained in this connection that by contracting the forward end of the main chamber 79, so as to form the so-called "secondary" chamber 79^a, the cartridges which are fed into the said chamber 79^a are measurably confined and have less opportunity than they would otherwise have for being thrown about and displaced by the extremely rapid action of the parts of the breech mechanism of the gun.

For the purpose of retaining the cartridges in the tubular magazine and preventing them from being fed out of the same otherwise than one at a time I employ a cartridge-gate 27, located in a vertical recess 78, formed in the left-hand side of the forward end wall of the main chamber 79 of the gun-frame. This gate swings in a plane at a right angle to the longitudinal axis of the magazine upon a heavy pin 80, extending forward through the forward end of the gun-frame and receiving in its projecting forward end the lower end of a leaf-spring 81, located in a groove 82 in the forward face of the gun-frame and having its upper end furnished with a knuckle 83, set into a groove 84, formed in the forward face of the gun-frame to receive it, as shown in Fig. 9. At its upper end the gate is formed with a bevel 85 for coaction with the wedge 26 aforesaid. Just before the breech-block 17 moves forward into its closed position the wedge 26 engages with the said bevel 85 and swings the gate from right to left sufficiently to clear the flange 86 of the gate from the hole 87, formed in the forward end of the gun-frame for the passage of the cartridges forward into and rearward from the tubular magazine 73, the rear end of which is threaded for being screwed into the enlarged threaded forward end of this hole 87. With this gate the cartridges can be fed out of the magazine only one at a time, and then only by the opening of the gate by the closing of the breech-block. The breech-block and the pivotal cartridge-carrier are by preference constructed and proportioned with regard to the length of the cartridges to be used so that the first—i. e., the rearmost—cartridge is fed nearly out of the tubular magazine 73 and the hole 87 in the gun-frame so as to rest almost entirely on the cartridge-carrier when the gun is fired, it being necessary only that the nose of the cartridge should extend forward far enough to keep the second cartridge with the head of which it is engaged in place, it being understood that at this time the cartridge-gate is open, as it always is, when the gun is closed. In this connection it is to be borne in mind that the action of the gun, being automatic, is exceedingly rapid and that in its rearward movement, following the explosion of a cartridge in the gun-barrel, the breech-block acts upon the pivotal carrier to lift the same and present the next cartridge so quickly that the distance the magazine-spring 76 must move the first cartridge after the gun has been fired in order to get it into position for being lifted by the carrier must be reduced to the minimum. In case the first cartridge should be thrown forward by the recoil after it has been entirely fed out of the tubular magazine 73 and hole 87 its nose is engaged with a bevel 27^a, formed upon the gate 27. Then as the cartridge is lifted the said bevel pushes it rearward and prevents it

from having any portion of its nose sheared off.

When the breech-block is in its closed position, it holds the cartridge-gate in its open position, as has been explained. Therefore if it is desired to empty the magazine without operating the gun this may be done by simply lifting the carrier which will permit the magazine-spring to eject all of the cartridges in the magazine. I am thus enabled to take advantage of the holding of the gate open by the breech-block to empty the magazine speedily and without opening the gun. More than this, if the user of the arm desires he may remove one or more or all of the cartridges just as suits him best, because the carrier always remains under the control of his finger. If for an instant he lets up on the upward pressure of the carrier, the same will be pushed down into position to cut off the egress of any more cartridges from the magazine.

As the breech-block 17 moves rearward its cam-face 88 engages with the forward edge of the hammer 89 and swings the same rearward on its pivot 90 until its cocking-notch 91 is entered by the forward end 92 of a sear 93, hung on a pin 94, also serving for the trigger 95, which is constructed so that it cannot act directly upon the rear end 96 of the sear, but only through the intermediation of a coupling-leaf 97, located at the forward end of a sliding pivotal timing-piece 98, attached by a pivot 99 to the lower arm 100 of a timing-lever 101, having a long tubular bearing 102, receiving a pin 103, mounted in the upper rear corners of the opposite side flanges of the rear chambered portion of the lower tang 7. The upper arm 104 of the said timing-lever 101 extends forward and is engaged with and depressed by a cam 105, Fig. 15, formed upon the finger-like extreme rear end of the left-hand wall of the breech-block 17. A coiled spring 106, having one end inserted into a socket 107, formed in the timing-lever 101 and its projecting end engaged with a shoulder 108 at the rear end of the timing-piece 98, exerts a constant effort to depress the leaf 97 of the timing-piece and to lift the arm 104 of the timing-lever. When the breech-block moves forward into its fully-closed position, its cam 105 rides over the forward end of the arm 104 of the timing-lever 101 and permits the same to be swung on its pin 103, whereby its arm 104 is lifted and its arm 100 moved forward and whereby, also, the timing-piece 98 is moved forward and the forward portion of the leaf 97, interposed between the trigger and the rear end 96 of the sear 93. Now when the trigger is pulled the timing-piece will be lifted against the tension of the spring 106 until the leaf 97 is brought into engagement with the end 96 of the sear, which is then operated for the retraction of its forward end 92 from the cock-

ing-notch 91 in the hammer 89, which is released to the action of the flat hammer-spring 109, which is connected at its forward end with the hammer by means of a link 110 and secured at its rear end to the lower tang 7 by means of a screw 111 and regulated in tension by a screw 112. At the very start of the opening movement of the breech-block its cam 105 will ride over the arm 104 of the timing-lever 101, which will be swung on its pin 103, so as to retract the leaf 97 of the timing-piece 98 from its position between the trigger 95 and the end 96 of the sear. Now if the trigger is pulled the sear will not be operated, as its operation requires the intermediation of the leaf 97. This timing device, therefore, prevents the trigger from being operated except when the gun is closed. I also provide the gun with a "safety" in the form of a lever 113, suspended by its upper end from a pivot 114 in the lower tang 7 and having its lower end entered into a slot 115 in the forward reach of the trigger-guard 116, which is a part of the said lower tang. The said lever 115 is formed with a stop-shoulder 117, coacting with a stop-finger 118 at the forward end of the trigger. When the safety 113 is pushed rearwardly, its shoulder 117 is moved under the finger 118, whereby the trigger is locked against operation under any circumstances. A sear-spring 119, secured to the lower tang by a screw 120, extends forward into position to engage with the rear end 96 of the sear for the operation thereof.

The operation of the several parts of my improved automatic firearm has been so fully described in conjunction with the description of their construction that it seems unnecessary to give a detailed description of the operation of the gun as a whole. It may be said, however, that the gun must be manually opened by its handle 10 for the introduction of the first cartridge into the gun-barrel. Now when the gun is fired the gases resulting from the explosion of the cartridge will automatically operate the breech mechanism, so as to extract and eject the spent shell, introduce another cartridge into the gun-barrel, cock the hammer, close the gun, and also permit another cartridge to move out upon the cartridge-carrier preparatory to being loaded into the gun-barrel; yet notwithstanding the automatic character of the gun it remains as much under the control of the user as any gun, for the reason that only one shot can be fired by any one operation of the trigger. Thus when the trigger is pulled its rear end is lifted for the operation of the sear in releasing the hammer, which has hardly fallen before the breech-block has operated the timing-lever so as to retract the leaf 97 of the timing-piece from its operating position between the trigger and the rear end of the sear. Now, although the hammer may be recocked the gun cannot be fired un-

til the user has "let up," so to speak, on the trigger and allowed the same to swing downward and forward sufficiently to permit the coupling-leaf to again move forward into position between the trigger and the sear.

It is apparent that in carrying out my invention some changes from the construction herein shown and described may be made. I would therefore have it understood that I do not limit myself thereto, but hold myself at liberty to make such departures therefrom as fairly fall within the spirit and scope of my invention.

Having fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. An automatic firearm having the right-hand side wall of its gun-frame formed near its forward end with an ejection-opening, and its left-hand side wall formed near its forward end with a gas-escape opening which latter extends alongside of the forward end of the breech-block of the gun when the said breech-block is in its closed position, whereby the escape of gas is provided for when the breech-block is in its closed position.

2. An automatic firearm having the right-hand side wall of its gun-frame formed with an ejection-opening and the left-hand side wall thereof formed with a gas-opening and its top formed with a handle-opening, and its bottom being made open for the reception of the lower tang and for the production in front of the said tang, of a loading-opening, the said gas-escape opening being located to provide for the escape of gas when the breech-block of the gun is in its closed position.

3. In a balanced breech-block automatic firearm, the combination with a gun-frame formed with a side ejection-opening and having its top closed at the front and rear except for a handle-opening, of a non-rotatable balanced breech-block, and a handle attached directly to the top of the breech-block and moving back and forth in the handle-opening which is closed by the block when the same is in its closed position, whereby the entire top of the frame is closed, when the block is in its closed position, and closed, except for the handle-opening, when the block is in its open position.

4. In a balanced breech-block firearm, the combination with a gun-frame having a handle-opening in its top and closed at its rear end to provide a recoil-abutment, of a non-rotatable balanced breech-block, and a handle secured to the breech-block through the said handle-opening which is closed by the block when the same is in its closed position, the said handle-opening being located to the rear of the front end of the frame and the handle being secured to the block to the rear of the forward end thereof, whereby the top

of the frame over the forward end of the block when the same is in its closed position, is left solid.

5. In an automatic firearm, the combination with a gun-frame having its rear end closed to form a recoil-abutment for the breech-block and formed in its right-hand side wall with an ejection-opening, in its left-hand side wall with a gas-escape opening and having a handle-opening located in its top at a point to the rear of the said gas-escape and ejection openings; of a non-rotatable balanced breech-block, and a handle attached to the top of the block to the rear of the forward end thereof and moving back and forth in the said handle-opening, the top of the frame in front of the handle-opening being left solid.

6. In a balanced breech-block firearm, the combination with a gun-frame having its rear end closed to form a recoil-abutment for the breech-block, and formed in its top with a handle-opening located to the rear of its front end; of a non-rotatable breech-block formed at its front end with a bolt-like extension or closure, and a handle attached through the said handle-opening to the breech-block at a point directly in the rear of the said bolt-like extension or closure which, when the breech-block is in its closed position, is covered by the solid portion of the top of the frame in front of the said handle-opening.

7. In a balanced breech-block automatic firearm, the combination with a gun-frame having its top formed with a handle-opening located to the rear of its front end and having its rear end closed to form a recoil-abutment for the breech-block; of a non-rotatable balanced breech-block rising into the said handle-opening, and a handle attached through the said handle-opening to the breech-block at a point to the rear of the front end thereof and overhanging the sides of the frame which is made solid in front of the said handle-opening to cover the forward end of the breech-block when the same is in its closed position.

8. In an automatic firearm, the combination with a reciprocating breech-block, of a lever operating upon the rear end thereof for moving it forward, and a flat spring coacting with the said lever for the operation thereof the forward end of the said spring extending forward over the pivot at the lower end of the lever upon which the spring exerts a forward thrust.

9. In an automatic firearm, the combination with a reciprocating breech-block, of a breech-block lever coacting at its upper end with the breech-block, and a flat spring extending forward over the pivot on which the lever swings and coacting with the lever to push the same forward, a firing-pin mounted

in the breech-block, a hammer located forward of the said lever for coaction with the said firing-pin, and a hammer-spring.

10. In an automatic firearm, the combination with a reciprocating breech-block, of a breech-block lever coacting at its upper end with the block and formed with an opening, and a flat spring extending forward into the said opening and engaging with the lever at a point in front of the pivot thereof for exerting a forward push on the lever.

11. In an automatic firearm, the combination with a gun-frame and an upper and a lower tang, of a reciprocating breech-block, a breech-block lever coacting at its upper end with the rear end of the block, a flat spring secured to the said upper tang and at its forward end extending over the pivot of the said lever for pushing the same forward, a firing-pin mounted in the breech-block, a hammer located in front of the said lever, and a hammer-spring connected with the said lower tang.

12. In an automatic firearm, the combination with a reciprocating breech-block, of a breech-block lever coacting at its upper end with the rear end of the breech-block and formed with an opening, of an antifriction-roller located in the forward portion of the said opening in front of the pivot on which the said lever turns, and a flat spring having its forward end extended into the said opening of the lever in position to coact with the said antifriction-roller.

13. In an automatic firearm, the combination with the gun-frame and the lower tang, of a reciprocating breech-block, a breech-block lever pivoted in the lower tang and formed with an opening, of an antifriction-roller carried by the said lever, and a flat spring secured to the gun-frame and extending forward into the opening in the said lever and engaging with the said roller and formed with a bevel through which it acts on the said roller to exert a constant effort to push the lever, and hence the breech-block, forward.

14. In an automatic firearm, the combination with a breech-block, of a swinging and longitudinally-yielding carrier engaged by the said block for being elevated and depressed into its cartridge-delivering and cartridge-receiving positions.

15. In an automatic gun, the combination with the breech-block, of a swinging carrier engaged by the said block for being swung into its elevated and depressed positions, and having an elongated pivot-hole and a spring-chamber extending forward thereof, a pivot passing through the said pivot-hole, a spring located in the said chamber in front of the said pivot, and a carrier-spring, whereby when the carrier is engaged by the breech-block for being swung into its elevated position, it yields longitudinally rearward.

16. In an automatic firearm, the combination with the gun-frame and the lower tang, of a reciprocating breech-block, a swinging and a longitudinally-yielding carrier mounted in the said tang and swung into its elevated and depressed positions by the block, and a carrier-spring mounted in the said tang and engaging with the carrier for holding the same in its elevated and depressed positions.

17. In an automatic firearm, the combination with a reciprocating breech-block, of a swinging and longitudinally-yielding carrier formed at its rear end with an upwardly-extending arm for engagement by the said block when the same moves rearward, whereby the carrier is swung into its elevated position and the forward portion of the said carrier being also adapted to be engaged by the said block for swinging the carrier into its depressed position on the forward movement of the block, and a carrier-spring coacting with the rear end of the carrier for holding it in its elevated and depressed positions.

18. In a balanced breech-block firearm, the combination with a gun-frame having a side ejection-opening made solid at the top of its front end, closed at its rear end to form a recoil-abutment and having the forward end of its main chamber reduced in dimensions to form a contracted secondary chamber into which the cartridges are fed prior to being introduced into the gun-barrel; of a balanced breech-block the forward end of which is reduced to adapt it to enter the said secondary chamber, an extractor carried by the said reduced forward end of the block, and means for ejecting the extracted shells through the said side ejection-opening.

19. In a balanced breech-block firearm, the combination with the barrel thereof, of a gun-frame having the top of its front end made solid, having its rear end closed to form a recoil-abutment and having the forward end of its main chamber contracted to form a secondary chamber; a breech-block adapted at its forward end to enter the said secondary chamber, an arm depending from the block, and a swinging carrier engaged by the said arm for operation thereby, the walls of the contracted secondary chamber confining the cartridges as they are being fed into the gun-barrel.

20. In a balanced breech-block firearm, the combination with a gun-frame having its upper front end made solid, its rear end closed to form a recoil-abutment, a side ejection-opening located to the rear of its front end and its main chamber contracted to form a secondary chamber; of a breech-block adapted to enter the said contracted secondary chamber, an arm depending from the block, and a swinging carrier engaged by the arm and adapted to receive the same as the breech-block moves into its closed position.

21. In a firearm, the combination with a

gun-frame having the top of its front end made solid, its rear end closed to form a recoil-abutment, a side ejection-opening located to the rear of its front end and the forward end of its main chamber contracted to form a secondary chamber; of a breech-block adapted to enter the said contracted secondary chamber, an arm depending from the breech-block, a pivotal carrier engaged by the said arm and lifted into its cartridge-delivering position thereby, an extractor mounted in the right-hand side of the breech-block at the forward end thereof, and an ejector located in the left-hand wall of the gun-frame.

22. In an automatic firearm, the combination with a reciprocating breech-block, of a hammer, trigger and sear, and a timing mechanism constructed and arranged to be engaged and operated directly by the rear end of the said breech-block for operation thereby, whereby the trigger and sear are operatively connected only when the gun is closed and ready for firing.

23. In an automatic firearm, the combination with a reciprocating breech-block, of a hammer, sear and trigger, a timing-lever having an upper and a lower arm, the former being adapted to be engaged directly by the rear end of the said breech-block for the operation of the lever directly thereby, and a spring-actuated timing-piece carried by the said lower arm of the timing-lever and adapted to be entered between the trigger and the sear for communicating the movement of the former to the latter.

24. In a firearm, the combination with a tubular magazine, of a breech-block, and a cartridge-gate pivoted at its lower end to swing in a plane at a right angle to the axis of

the magazine and operated by the said block and provided with an inclined lip to prevent the noses of the cartridges from shearing as they are lifted for introduction into the gun-barrel.

25. In a tubular magazine firearm, the combination with the gun-frame, of a tubular magazine, a reciprocating breech-block, a pivotal cartridge-carrier, a cartridge-gate for the said magazine, the said gate being opened by the said block when the same moves into its closed position and having an inclined lip to prevent the noses of the cartridges from shearing as they are lifted for introduction into the gun-barrel.

26. In a firearm, the combination with the gun-frame, of a reciprocating breech-block, a breech-block lever, a spring for operating the same, and two antifriction-rollers mounted in the said block on the same axis and respectively engaging with the gun-frame and the said lever and operating independently of each other.

27. In a firearm, the combination with the gun-frame, of a reciprocating breech-block, a breech-block lever, a spring for the operation thereof, and three antifriction-rollers mounted on the same axis in the upper rear corner of the breech-block, the central and larger roller being engaged with the said gun-frame and the smaller rollers being engaged with the said lever which clears the said central roller.

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

WILLIAM MASON.

Witnesses:

FREDERIC C. EARLE,
GEORGE D. SEYMOUR.