

No. 754,691.

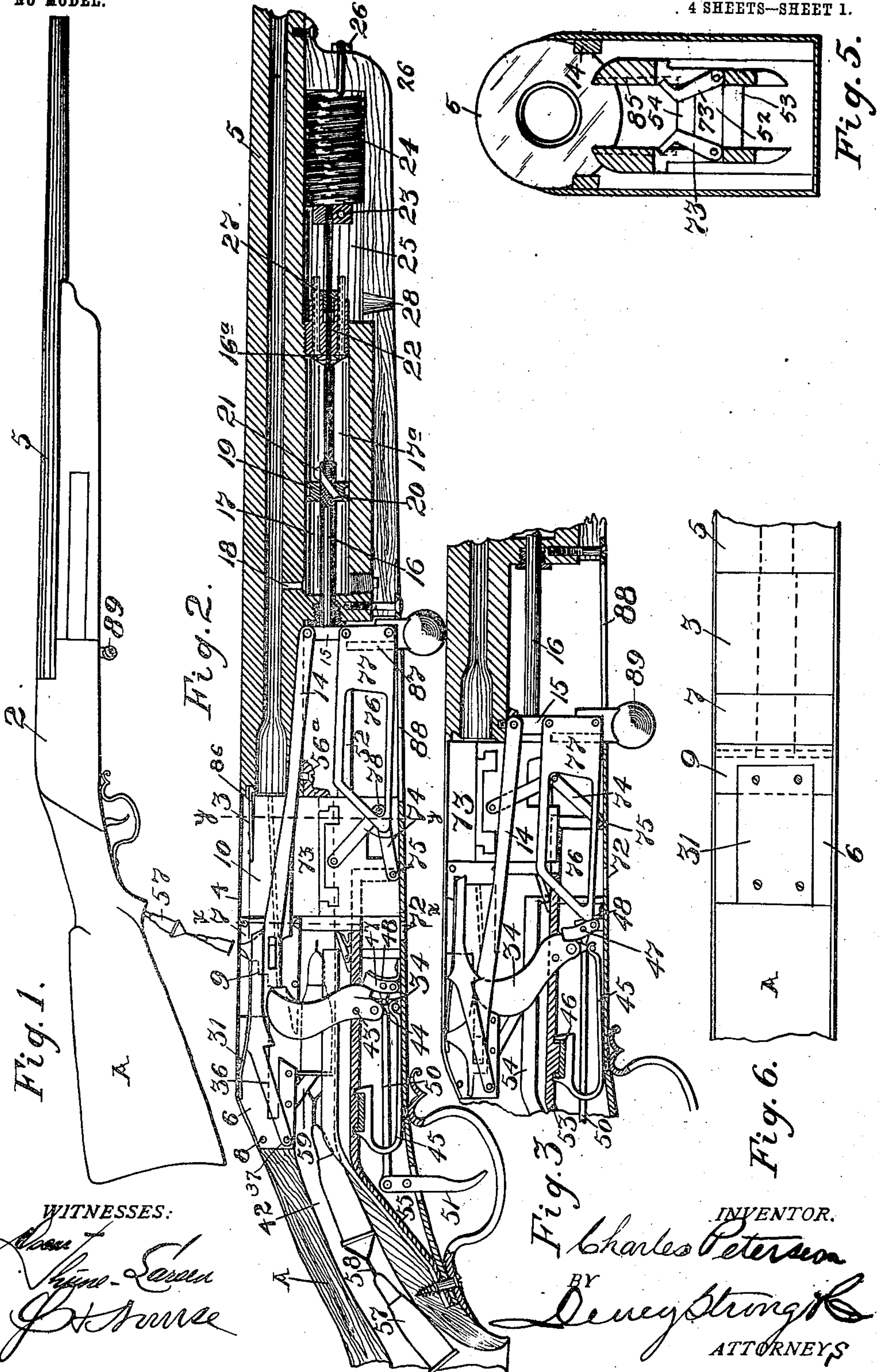
PATENTED MAR. 15, 1904.

C. PETERSEN.
AUTOMATIC GUN.

APPLICATION FILED JULY 21, 1902.

NO MODEL.

4 SHEETS—SHEET 1.



WITNESSES:

John Soren
St. Louis

INVENTOR.

Charles Petersen
BY *Denny Strong*
ATTORNEYS

No. 754,691.

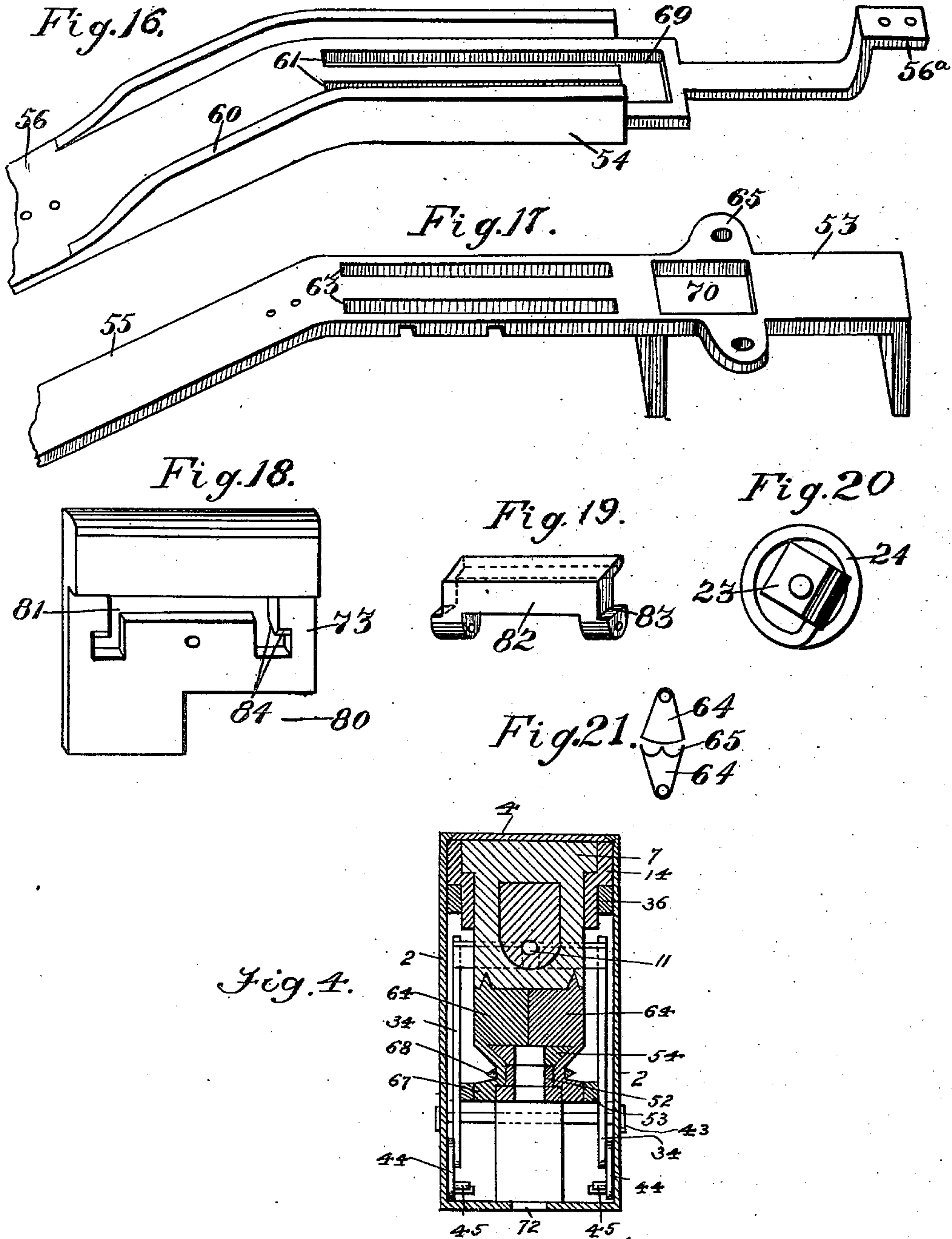
PATENTED MAR. 15, 1904.

C. PETERSEN.
AUTOMATIC GUN.

APPLICATION FILED JULY 21, 1902.

NO MODEL.

4 SHEETS—SHEET 2.



WITNESSES:

Robert S. Sear.
John H. Sear.

INVENTOR.

Charles Petersen

BY

Wm. Strong & Co.
ATTORNEYS

No. 754,691.

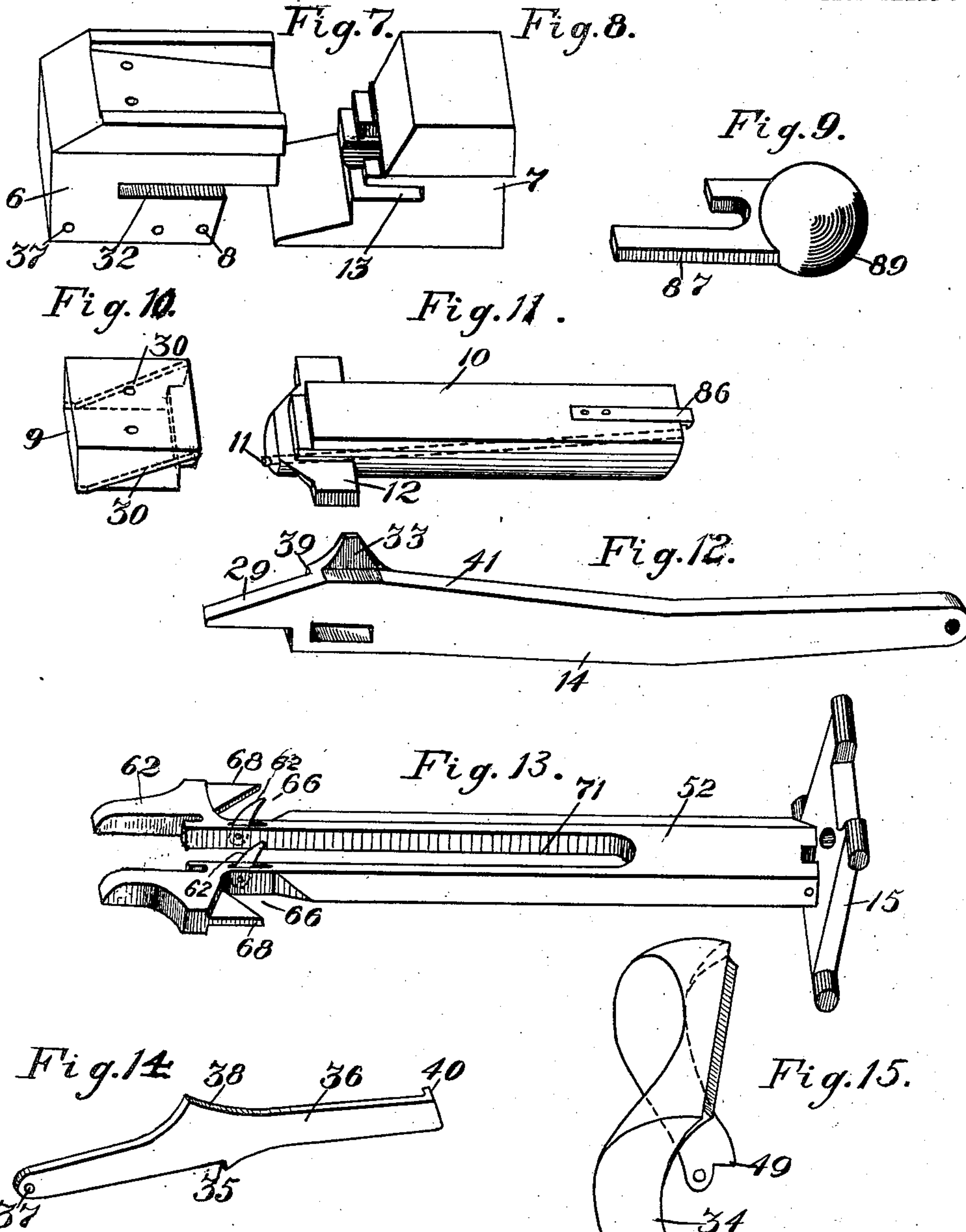
PATENTED MAR. 15, 1904.

C. PETERSEN.
AUTOMATIC GUN.

APPLICATION FILED JULY 21, 1902.

NO MODEL.

4 SHEETS—SHEET 3.



WITNESSES:
John S. Larsen
John S. Larsen

INVENTOR.
Charles Petersen
BY
Derey Strong
ATTORNEYS

No. 754,691.

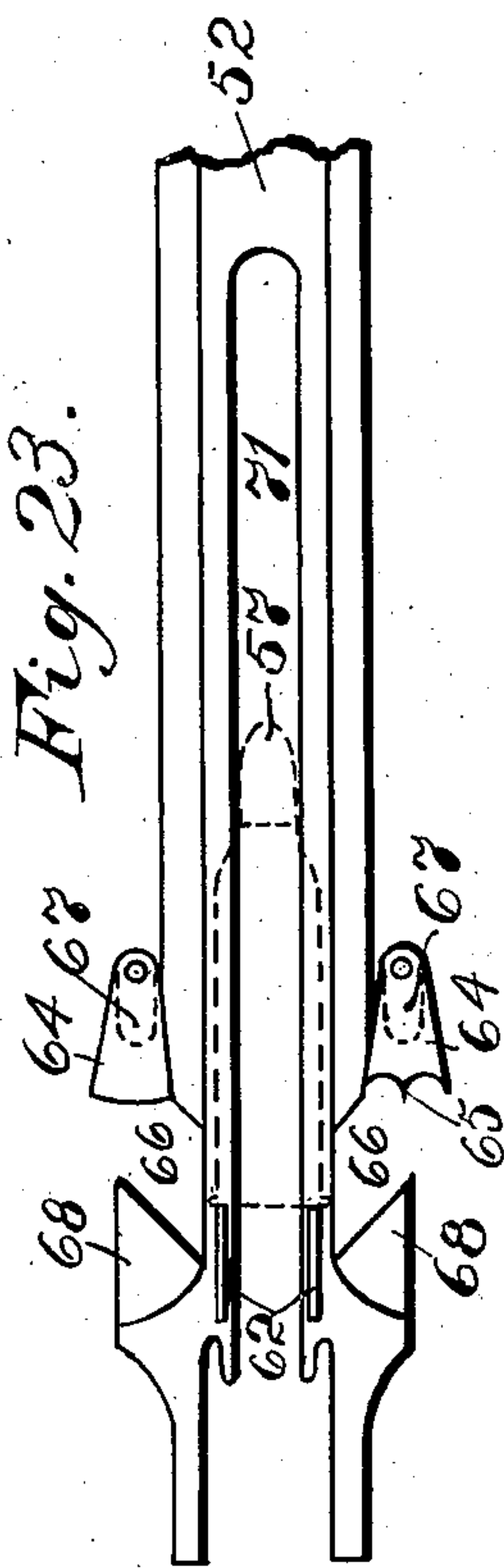
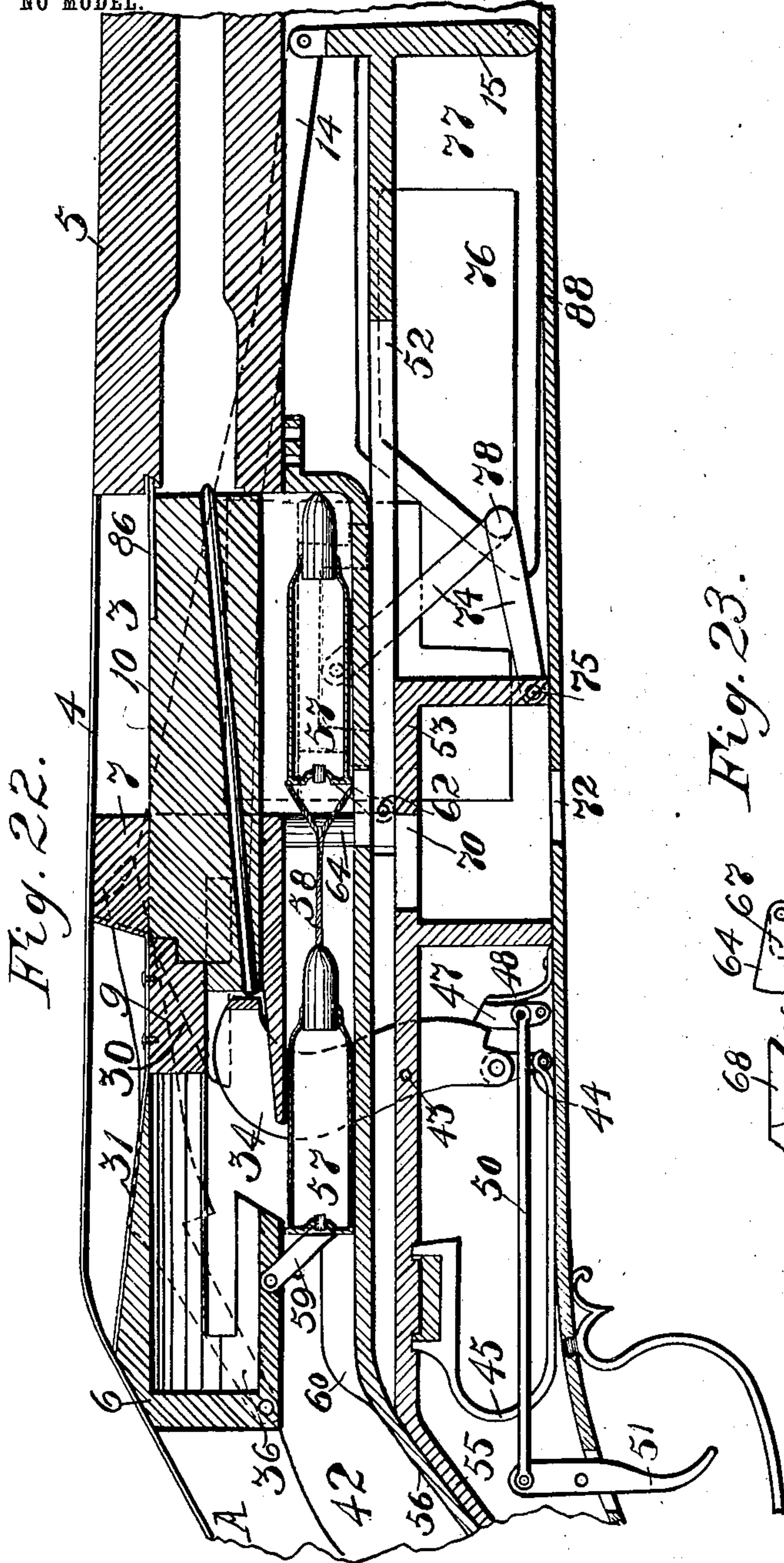
PATENTED MAR. 15, 1904.

C. PETERSEN.
AUTOMATIC GUN.

APPLICATION FILED JULY 21, 1902.

NO MODEL.

4 SHEETS—SHEET 4.



WITNESSES:

Wm. H. Sarsen
J. H. Sarsen

INVENTOR.

Charles Petersen
BY *Dwight Strong & Co.*
ATTORNEYS

UNITED STATES PATENT OFFICE.

CHARLES PETERSEN, OF SAN FRANCISCO, CALIFORNIA.

AUTOMATIC GUN.

SPECIFICATION forming part of Letters Patent No. 754,691, dated March 15, 1904.

Application filed July 21, 1902. Serial No. 116,431. (No model.)

To all whom it may concern:

Be it known that I, CHARLES PETERSEN, a citizen of the United States, residing in the city and county of San Francisco, State of California, have invented an Improvement in Automatic Guns; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to improvements in firearms of the automatic type. Its object is to provide a gun which may be loaded and discharged continuously through the medium of the expanding gases in the barrel in contradistinction to automatic arms which depend for their continuous action on recoil.

The invention consists in the construction and arrangement of parts, which will be more fully set forth hereinafter, having reference to the accompanying drawings, in which—

Figure 1 is a side elevation of my gun. Fig. 2 is a partial longitudinal vertical section thereof and part elevation with a wall of the receiver removed. Fig. 3 is a similar view showing hammer in cocked position. Fig. 4 is a transverse vertical section on line *xx* of Fig. 1. Fig. 5 is a transverse vertical section of elevator mechanism on line *yy*, Fig. 1. Fig. 6 is a top view of part of the breech. Fig. 7 shows the rear guide-block. Fig. 8 shows the front guide-block. Fig. 9 shows the handle to operate the breech mechanism manually. Fig. 10 shows the reciprocating lock-block. Fig. 11 shows the breech-bolt. Fig. 12 shows an arm which actuates the breech-bolt and lock-block. Fig. 13 shows the sliding bar which actuates the cutters. Fig. 14 shows a sear. Fig. 15 shows the hammer. Fig. 16 shows the upper guide-bar. Fig. 17 shows the lower guide-bar. Fig. 18 shows an elevator guide-plate. Fig. 19 shows a part of the elevator. Fig. 20 is a detail of the pneumatic mechanism. Fig. 21 is a plan of the cutters. Fig. 22 is a vertical longitudinal sectional view through the breech mechanism, showing the cartridge-carrier depressed and the bolt thrown forward and the hammer released from the position shown on Fig. 3. Fig. 23 is a plan view showing the relation of the conveyer-bar 52 and the cutters.

A represents the stock; 2, the walls of the

receiver; 3, the receiving-chamber; 4, a sliding plate adapted to close the opening in the top of the receiving-chamber through which the empty shell is ejected, and 5 the barrel.

6 and 7 are two blocks, Figs. 7 and 8, fixed by means of screws 8 in the receiver rearward of the receiving-chamber and between which a locking-block 9, Fig. 10, for the breech-bolt 10, Fig. 11, reciprocates. The latter is slidable and guided in the block 7 and carries the firing-pin 11. The end of the breech-bolt and the adjacent faces of the blocks 7 and 9 are correspondingly stepped, so that when the bolt is thrown forward and the block 9 is dropped the parts will be firmly locked together and the bolt held against recoil. The bolt has a cross-head 12 at its rear end slidable in a slot 13 in the block 7. The ends of the cross-head project beyond the sides of the block and are engaged by arms 14, Fig. 12, which have their forward ends pivoted to a cross-head plate 15, Fig. 13, which is secured on the end of a piston-rod 16, operating in the chamber 17. This chamber is formed just below the barrel, and its rear end communicates with the barrel-chamber through a small passage 18. The rod 16 carries the piston 19, and the space on either side of the piston is connected by a passage 20 through the piston. A valve 21 allows the gases to pass from the barrel-chamber into the space 17^a behind the piston, but prevents its return through the passage 20. The piston-rod 16 operates through a plug 22 at the front end of the chamber 17, and the outer end of the rod carries a nut 23, Fig. 20, to which one end of a coil-spring 24 is attached. This spring is incased in the chamber 25 and has its other end suitably secured, as at 26. The portion of the rod 16 that operates through the plug and extends into the spring-chamber is reduced in size. In the plug 22, surrounding the rod and extending parallel therewith, are one or more exhaust-valves 27, which have their heads projecting within the compression-chamber and their grooved stems projecting into the spring-chamber, whereby the valves will be opened by reason of the nut 23 striking their stems when the spring is expanded and will be closed on the contraction of the spring by reason of a disk 16^a on the stem

striking the heads of the valves. The spring-chamber 25 communicates with the open air through port 28. In operation the expanding gases in the barrel will immediately follow-
 5 ing discharge and before the projectile leaves the muzzle seek an outlet through the port 18. This will cause a compression in chamber 17 which will be immediately equalized
 10 in space 17^a by reason of gases passing through passage 20. As the bullet leaves the muzzle of the gun the confined gases in the barrel are immediately released, with a resulting inequality of pressures on piston 19. Accord-
 15 ingly valve 21 closes and the compressed gases in 17^a expand to drive piston 19 forward. The moment the valves 27 are opened, as before described, pressure in chamber 17^a is released and the spring 24 retracts the piston, while the
 20 disk 16^a closes the valves 27 and leaves the compression-chamber in readiness for the next charge of gas. The length of the valve-stems and the movement of the valves are sufficient to prevent the valves being closed by pres-
 25 sure of the exhausting gases. This reciprocating movement of the rod 16, occasioned alternately by the expansion of the gases and the contraction of the spring 24, operates the loading, discharging, and reloading mechanism in the following manner: The movement
 30 of the piston toward the port 18 causes the arms 14 to simultaneously carry the breech-bolt backward. The arms have the inclined surfaces 29, which ride under the correspond-
 35 ingly-inclined ledges 30, Fig. 10, of the lock-block 9 to lift the latter, which is secured to a spring 31, Fig. 6, normally lying in an inclined recess or channel on the top of and
 40 having one end secured to block 6. The latter is slotted, as at 32, and suitably chambered to receive the cross-head 12 and end of the breech-bolt when the bolt is retracted to its full limit. The arms have the lateral pro-
 45 jections 33, which engage the plate 4 to carry it backward to open the receiving-chamber and allow the shell to be ejected. The plate 4
 50 is slidable in guides on the sides of the receiver. The breech-bolt carries the hammer 34, Fig. 15, with it on its rearward movement to a cocked position, where it is engaged and
 55 held by the notch 35 on the sears 36. There are two sears—one on either side of block 6 and pivoted thereto at 37. These sears, Fig. 14, each have an upper cam-surface 38, on
 60 which an inclined surface 39 on the outside of each of the arms 14 slides, and the end of each sear has a projection 40 riding on the upper cam-surface 41 of each of the arms. The oscillation of the sear is therefore a positive movement dependent on and governed by the
 65 reciprocation of the arms 14.

The hammer 34, Fig. 15, is adapted to straddle the magazine-passage 42 and is pivoted in the breech at 43. The head of the hammer is free to move in the space between the blocks
 65 6 and 7. The shorter arms of the hammer are

connected by links 44 with the mainsprings 45, which are clamped to a cross-piece 46, held fixedly within the breech.

47 represents dogs pivoted intermediate of their ends and adapted by means of springs 48
 70 to engage notches 49 on the ends of the hammer members. These dogs connect by means of the rods 50 with the trigger 51. Where a
 75 number of shots are to be fired in rapid succession, it will only be necessary to pull the trigger once and to hold the trigger, while the operation of discharging and reloading will be
 80 entirely automatic. The curve of the surfaces 38, 39, and 41 is such that the sears will be depressed or raised suddenly at the end of each stroke of the breech-bolt to engage or release
 85 the hammer, while the latter will be free to sweep through the arc on the under side of the sears, the latter being depressed by the shoulder 39 running up the steeper incline 38 at the
 90 moment the hammer is in position to be engaged in the notch 35 when the bolt is retracted to nearly its fullest extent, while the sears are raised to disengage the hammer when the bolt is thrown forward by reason of the
 95 projections 40 running up the steeper incline of 41. Simultaneously with the cocking of the hammer by engaging the notches 35 on the sears the dogs 47 engage the notches 49 on the hammer, so that the firing may be controlled by the trigger, if desired.

The loading of the piece is effected by the following mechanism: The cross-head 15 on piston-rod 16 has secured to it a feed or conveyer bar 52, Fig. 13, which is reciprocable
 100 in unison with the breech-bolt and moves between the bridge-plates 53 and 54, Figs. 17 and 16. The latter plates are straddled by the hammer. The lower plate 53 is supported
 105 in the bottom of the receiver and has a tang portion 55, by which it is secured to the stock. The plate 54 has an inclined or curved tang 56 at its rear end, by which it is suitably secured, and its other end is fastened, as at 56^a,
 110 to the under side of the barrel, as in Figs. 2 and 22, so as to leave the space between plates 53 and 54 open except at the rear for the free reciprocation of conveyer-bar 52. The ammunition is fed into the magazine 42 through an
 115 opening in the under side of the stock. The plate 54 is a continuation of the bottom of the magazine-channel. In the present instance I have shown the ammunition as consisting of
 120 cartridges 57, connected together in a chain by means of fine wires 58. These wires are secured at one end in the projectile, and the other embraces the rim of the shell, so that the cartridges are united in a chain and may
 125 be packed closely in a box end for end. The wire is of sufficient elasticity and strength to admit of a string of cartridges being inserted into the magazine 42, and by means of the automatic devices to be described are drawn into the firing-chamber as rapidly as required.
 130 At the same time the wire is very soft and

can be easily severed. The chain may be of any length, so that the fire may be prosecuted without interruption. In operation one end of the chain is inserted into the magazine-passage 42 and the cartridges pushed forward till the first is engaged by the stops 59, pivoted in the upper wall of passage 42, which prevent the withdrawal of those cartridges already in the magazine. The latter extends beneath the blocks 6 and 7 and above the plate 54. The plate 54 has the lateral flanges 60, between which the cartridge is guided. The bottom of the plate is slotted, as at 61, and the spring-pressed fingers 62, pivoted on the rear end of bar 52, project up through these slots to engage the cartridge when the bar 52 is at its rearmost limit of travel to draw the cartridge forward into the receiving-chamber 3. These fingers are depressed on their rearward movement to pass beneath a cartridge. The lower ends of the fingers run in guide-grooves 63 in the plate 53.

64, Fig. 21 and Fig. 4, represents the wire-cutters with their upper ends pivoted in the bottom of block 7 and their lower ends stepped in lugs 65 in plate 53. These cutters are adapted to open and close like a door as the bar 52 moves back and forth. They are disposed in the path of the cartridges and in the plane of the rear wall of the receiving-chamber, and the bar 52 is adapted to open them to admit a cartridge to the receiving-chamber and to close them behind the cartridge to cut the wire. The adjacent surfaces of the cutters are preferably made one convex and the other with a plurality of cutting edges 65, as shown in Fig. 21. The bar 52 is provided with the rearwardly-convergent cam-slot 66, in which the crank-arms 67 on the cutters are adapted to be engaged at about the moment the bar reaches the end of its forward stroke. The bar in its movement to and fro between the crank-arms 67 spreads the latter to open the cutters at all times except when the arms are drawn into the slots 66 by the lateral projections 68 on the bar. Just as the cartridge is drawn into the receiving-chamber by the bar 52 and fingers 62 the crank-arms 67 are engaged in the cam-slots 66 to close the door-cutters, and the wire is bitten off close to the shell of the cartridge in the chamber and close to the projectile of the front cartridge in the magazine, and the short pieces of wire drop down through openings 69 70 in the respective bars 54 53 and the slot 71 in the bar 52 and out through the opening 72 in the bottom of the receiver. In the receiver the cartridge is delivered upon the cartridge-carrier, by which it is lifted into alinement with the breech-bolt. This cartridge-carrier consists of the vertically-slidable plates 73, Fig. 18, disposed between the walls of the receiver and the plates 52 53 54 and guided by the latter and are pivoted to the knee-levers 74, operating in the space between the plates 73 and the receiver-walls. The lower

arms of these levers are pivoted to the breech at 75. The pivot-pin 78 at the joint of each knee-lever projects into and is movable in a trapezoidal slot 76 in a link 77, which is secured to the cross-head 15. The links 77 reciprocate in unison with the latter and with the arms 14 and bar 52. The slots 76 allow the bar 52 and breech-bolt to be moved a considerable distance in either direction while the cartridge-carrier remains stationary. The guide-plates 73 are cutaway, as at 80, Fig. 18, to accommodate the lower arms of the levers 74. Each of the plates 73 is slotted, as at 81, and members 82, Fig. 19, are pivoted in these slots and project inwardly into the space between the guides to receive and support a cartridge as it is drawn in from the magazine through the cutter-doors. When the cartridge-carrier is normally at its lowest point, these supporting members or carriers 82 will lie against the inclined sides of the parts 52 54, as shown in Fig. 5. In that position they form a trough to receive and support the cartridge, and they retain that form as the carrier is lifted to bring the cartridge into line with the breech-bolt ready to be driven forward into the firing-chamber of the barrel. Their tendency to approach each other is limited by reason of the shoulders 83 engaging corresponding ledges 84 on plates 73. Springs 85 serve, on the other hand, to throw them always toward each other, Fig. 5.

In operation assume a cartridge to be in position in the firing-chamber of the barrel, the breech-bolt thrown forward and the hammer engaged by the dogs 47, ready for firing, a cartridge in the receiving-chamber on the carriers 82, and a string of cartridges in position in the magazine. On pulling the trigger 51 discharge takes place, and the gases generated in the barrel will operate the piston, as before described. The movement of the cross-head 15 toward the butt of the gun carries with it the arms 14, bar 52, and links 77, and they each operate their several mechanisms coordinately. The arms 14 retract the bolt, open the slide 4, eject the shell by means of the ejector 86 on top of the bolt, lift the lock-block 9, carry the hammer back, and engage it in the notches 35 of the sears. Simultaneously the bar 52 moves back to the end of its stroke between the plates 53 and 54 and between the cutters 64 until the fingers 62 engage behind the next shell in the magazine. Also the links 77 have moved the length of the slots 76—i. e., till the pivot-pins 78 strike the front walls of the slots—before the cartridge-carrier starts to rise. This has given time enough for the retraction of the breech-bolt and the ejection of the shell. While the carrier is moving vertically during the remainder of the rearward movement of the links 77 the retraction of the breech-bolt is completed, so that no obstacle is interposed to the carrier or cartridge. Just as the ham-

mer is engaged by the notches 35 and the fingers 62 engage a fresh shell and the cartridge on the carrier is in line with the breech-bolt at that moment exhaust takes place in space 17^a to allow the spring 24 to operate. The arms 14, bar 52, and links 77 return to their original positions, the arms 14 carrying the breech-bolt, which drives home the cartridge. The links 77 again travel the length of the slots 76 before they trip the cartridge-carrier, which distance is sufficient to allow the breech-bolts to carry the cartridge well into the barrel to support it without further aid from the carrier. The bar 52 and fingers 62 draw a cartridge which is still connected with the chain forward through the open cutter-doors and partly into the receiving-chamber and beneath the pivoted carriers 82 before the carrier starts to descend. At that moment the pivot-pins 78 strike the rear inclined walls of the slots 76 and trip the knee-levers to allow the carrier to descend, and the carriers 82 open to pass around the cartridge, the springs 85 causing them immediately to close again on the under side of the cartridge in readiness to lift it when required. The cutter-doors 64 are operated, as before described, to sever the wire and leave the cartridge now in the receiving-chamber wholly disconnected from the chain in the magazine. The arms 14 have raised the sears just as the bolt completes its forward travel across the receiving-chamber and has the cartridge lodged in the firing-chamber of the barrel. This leaves the hammer supported on the dogs 47, providing the trigger is released. If the trigger has remained retracted, the discharge of the gun would be automatically effected the moment the bolt is thrown forward, so that the arms 14 have lifted the sears to disengage the hammer from the notches 35. Thus without further attention on the part of the operator than to pull the trigger and hold it in such position discharge, ejection, and reloading will continue automatically so long as there are cartridges in the magazine-channel. As the ammunition-chains may be of any length, they serve in lieu of special ammunition carriages or magazines. In loading the piece in the first place a cartridge is shoved into the magazine-channel until it is engaged by the spring-stops 59. An arm 87, Figs. 2 and 9, secured to the bar 52, projects out through the bottom of the receiver and is movable in the slot 88. By taking hold of a button 89 on this arm the loading mechanism may be actuated to carry a cartridge forward into the firing-chamber.

While I have shown my invention embodied in a rifle, it is apparent that the same principles may be applied in guns of any character, size, or caliber.

By certain modifications in the magazine the piece could be adapted for use with ordinary ammunition.

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

1. In an automatic gun, the combination of a barrel, a compression-chamber, a piston movable therein, a port opening between the barrel-chamber and one end of the compression-chamber, a valve in said piston through which gases may pass to equalize the pressure on opposite sides of the piston, a piston-rod extending through each end of the compression-chamber, breech mechanism connecting with one end of said rod and retracting means tending to operate in opposition to said controlling medium.

2. In an automatic gun, the combination of a barrel, a compression-chamber, port connections between said chamber and the barrel-chamber, a piston movable in the compression-chamber, a valve in said piston through which the gases may pass to equalize the pressure on opposite sides of the piston, a piston-rod extending through said chamber, breech mechanism operated by one end of said piston-rod, a retracting-spring on the other end of said rod and exhaust-valves in said chamber operated by the movements of the piston.

3. In an automatic gun, the combination with breech-loading mechanism of a barrel, a compression-chamber, connections between the barrel and chamber whereby gases generated by discharge are admitted to said chamber, a piston movable in said chamber, a valve in the piston by which the pressure on opposite sides of said piston is equalized during the progress of the missile through the barrel and means by which the gases in the space on one side of the piston are released coincidently with the departure of the missile from the muzzle whereupon an inequality of pressure on the opposite sides of the piston is effected to operate the latter.

4. In an automatic gun, the combination of a barrel, a compression-chamber, a port connecting said chamber and barrel, a piston movable in said chamber, a valve-controlled port connecting the ends of the chamber on opposite sides of the piston, a piston-rod extending through both ends of said chamber, breech mechanism connecting with one end of said rod, and retracting means on the other end thereof.

5. The combination in an automatic gun of a compression-chamber, connections therebetween and the barrel through which gases generated in explosion may be admitted to said chamber, a piston movable in the latter, a piston-rod extending through said chamber, a cross-head on one end of said piston-rod exterior to the chamber, retracting means on the other end of said rod acting in opposition to the confined gases in the chamber, a breech-bolt, means by which a cartridge is inserted into the receiving-chamber of the breech, a cartridge-carrier in said receiving-chamber

by which the cartridge is lifted into line with the bolt when the latter is retracted, and connections between said bolt, cartridge-carrier and cross-head by which the said parts are operated coördinately.

6. The combination in an automatic gun of a compression-chamber, a piston therein, means for admitting a propelling medium to move said piston, a piston-rod extending exterior to said chamber, a breech-bolt, a bar by which cartridges are fed into the receiving-chamber of the breech, a carrier by which cartridges are conveyed into line with the breech-bolt when the latter is retracted, and connections between said bolt, bar and carrier and the end of said piston-rod whereby the said bolt, bar and carrier are moved to coöperate on each reciprocation of the piston.

7. The combination in an automatic gun, of a compression-chamber, a piston therein, a piston-rod, a cross-head on said rod exterior to the chamber, a reciprocating breech-bolt, a hammer adapted to be cocked by the rearward movement of the bolt, arms connecting said bolt and the cross-head of the piston-rod, a bar connected with said cross-head and adapted to insert a cartridge into the receiving-chamber of the breech, a cartridge-carrier, slotted links secured to the said cross-head, and intermediate connections between said slotted links and carrier by which the latter is operated on the reciprocation of the piston.

8. The combination in an automatic gun, of a compression-chamber, a piston therein, a piston-rod, a cross-head on said rod exterior to said chamber, a breech-bolt, a guide-block in which said bolt is slidable, a spring-pressed vertically-operating lock-block located in rear of said guide-block, pivoted sears, arms connecting said bolt and cross-head on the piston-rod, said arms having cam-surfaces engaging said sears to operate the latter, a sliding plate by which the top of the receiver is closed, projections on the arms engaging said plate to move it simultaneously with the breech-bolt, a bifurcated hammer, means including a bar connected with the piston-rod cross-head by which a cartridge is inserted into the receiving-chamber of the breech, a vertically-movable cartridge-carrier, slotted links connected to said cross-head and knee-levers intermediate of the carrier and said links.

9. In a gun, the combination of a breech-bolt, a vertically-operating cartridge-carrier, arms connected with the bolt, toggle-levers having one member connected with the gun-frame and the other with the carrier, means connecting said arms and levers whereby they are operable in unison, and means by which said bolt and carrier are moved successively at each movement of their respective arms and levers.

10. In a gun a breech mechanism including

a reciprocating breech-bolt, a bifurcated hammer adapted to be cocked by the bolt on its rearward movement, arms connected with said bolt, means including a feed-bar to insert a cartridge into the receiving-chamber of the breech, a cartridge-carrier, knee-levers having one member connected with the gun-frame and the other with said carrier, and connections between a source of power and said bolt-arms, feed-bar and knee-levers by which they are moved in unison.

11. In a gun, the combination of a breech-bolt, actuating-arms therefor, a vertically-movable cartridge-carrier in the receiving-chamber, knee-levers having one end pivoted in the frame and the other to the carrier, slotted links engaging said knee-levers, and connections between the outer ends of said first-named arms and said links by which said arms and links may be moved in unison to operate the bolt and carrier in suitable relation to each other.

12. In a gun, the combination with the receiving-chamber thereof, of a horizontally-reciprocating breech-bolt, a vertically-movable cartridge-carrier, means including a horizontally-operating bar by which cartridges are drawn singly into the receiving-chamber, arms connecting with said breech-bolt, knee-levers having one member pivoted to said carrier and the other member pivoted to the breech and means by which said arms, bar and knee-levers are given a coördinate movement.

13. In a gun, a breech mechanism, including a reciprocable breech-bolt, a guide-block in which said bolt is slidable, a cross-head on said bolt, actuating-arms engaging said cross-head, gas-operated means with which said arms are connected, a vertically-reciprocable cartridge-carrier and connections between said gas-operated means and carrier whereby the carrier and bolt are given a coördinate movement.

14. In a gun, a breech mechanism including a reciprocable breech-bolt, a cross-head thereon, arms engaging said cross-head, means by which said arms are actuated, a hammer, a pivoted sear with which said hammer is engaged to cock the piece, and connections between said sear and arms by which the sear is given a positive oscillating movement.

15. In a gun, a breech mechanism, including a breech-bolt, arms connected with a source of power by which the breech-bolt is actuated, a hammer, pivoted sears adapted to be engaged by said arms so as to be given a positive oscillating movement to engage said hammer when the arms and bolt are at their farthestmost point in one direction and to release the hammer when said bolt and arms are at their farthestmost point in the other direction.

16. In a gun, a breech mechanism including a reciprocable breech-bolt, a guide-block in which said bolt is movable, a cross-head on said bolt, arms engaging said cross-head ex-

terior to the guide-block, cam-surfaces on said arms, a hammer, sears having cam-surfaces, one end of said sears engaging a cam-surface of the arms which operate the bolt, and the arms having projections engaging cam-surfaces of the sears whereby the latter are oscillated positively by the movement of the arms and breech-bolt.

17. In a gun, a breech mechanism including a reciprocable breech-bolt, a fixed guide-block in which said bolt is slidable, a fixed block rearward of said guide-block, a spring-pressed vertically-operating lock-block intermediate of said fixed blocks, pivoted sears operable in relation to the movements of the bolt and a hammer adapted to be pressed back by the breech-bolt when the latter is retracted and engaged by said sears.

18. In a gun, the combination of a reciprocable breech-bolt, guide and lock blocks therefor, a bifurcated hammer, actuating-arms for said bolt, means for operating said arms, pivoted sears having cam-surfaces engaging corresponding cam-surfaces on said arms and means by which a cartridge is introduced into the receiving-chamber in line with the breech-bolt.

19. In a gun, the combination of a reciprocable breech-bolt, guide and locking means therefor, a bifurcated hammer straddling the magazine, said hammer pivoted intermediate of its ends, links on the shorter arm of said hammer, springs engaging said links adapted to throw the hammer forward into engagement with the breech-bolt which carries the firing-pin, dogs engaging notches on said hammer to connections between said dogs and the trigger, actuating-arms for said bolt, means for operating said arms, sears engaging cam-surfaces on said arms and having a positive oscillatory movement according as the bolt moves back and forth.

20. In a gun having a magazine-passage in the stock, a receiving-chamber, a horizontally-reciprocable breech-bolt, a vertically-movable cartridge-carrier in the receiving-chamber, means by which a cartridge may be inserted into the receiver upon the carrier, and a hammer straddling the magazine-passage and movable rearwardly with the movement of the breech-bolt.

21. In a gun, having a magazine-passage in the stock, a receiving-chamber, a cartridge-

carrier movable in said chamber, means by which a cartridge may be inserted into the receiving-chamber said carrier comprising vertically-operating guide-plates, and hinged supports on said plates, which are adapted to pass out and around a cartridge lying in the receiving-chamber when the carrier descends and to engage beneath the cartridge to raise the latter when the carrier is lifted.

22. In a gun of the character described, the combination with the receiving-chamber thereof, of a reciprocable breech-bolt, a horizontally-operating bar by which cartridges are drawn singly into the chamber, and hinged cutters actuated by said bar to sever a cartridge from a chain.

23. In a gun of the character described, the combination with the magazine and receiving-chamber thereof, of means for retaining a chain of cartridges in the magazine, hinged cutter-doors disposed in said magazine, a reciprocating feed-bar operable between said doors by which a cartridge is engaged and drawn into the receiving-chamber, and having cam-slots on said bar by which said doors are operated to close and sever said cartridge from the chain.

24. In a gun of the character described, the combination with the magazine-chamber and receiving-chamber thereof, of a reciprocable breech-bolt, a cartridge-carrier movable vertically in the receiving-chamber, means connected with the breech-bolt for operating the carrier, a bar by which cartridges are drawn from the magazine into the receiving-chamber, connections between the breech-bolt and the said bar, and the hinged cutters in operative connection with said bar by which the cartridge is severed.

25. In a gun of the character described, the combination with a magazine-chamber adapted to receive a chain of cartridges of feed mechanism by which the cartridges may be delivered singly into the receiving-chamber and hinge-cutters operable by said feed mechanism by which the cartridge may be severed from the rest of the chain.

In witness whereof I have hereunto set my hand.

CHARLES PETERSEN.

Witnesses:

L. MEININGER,
S. H. NOURSE.