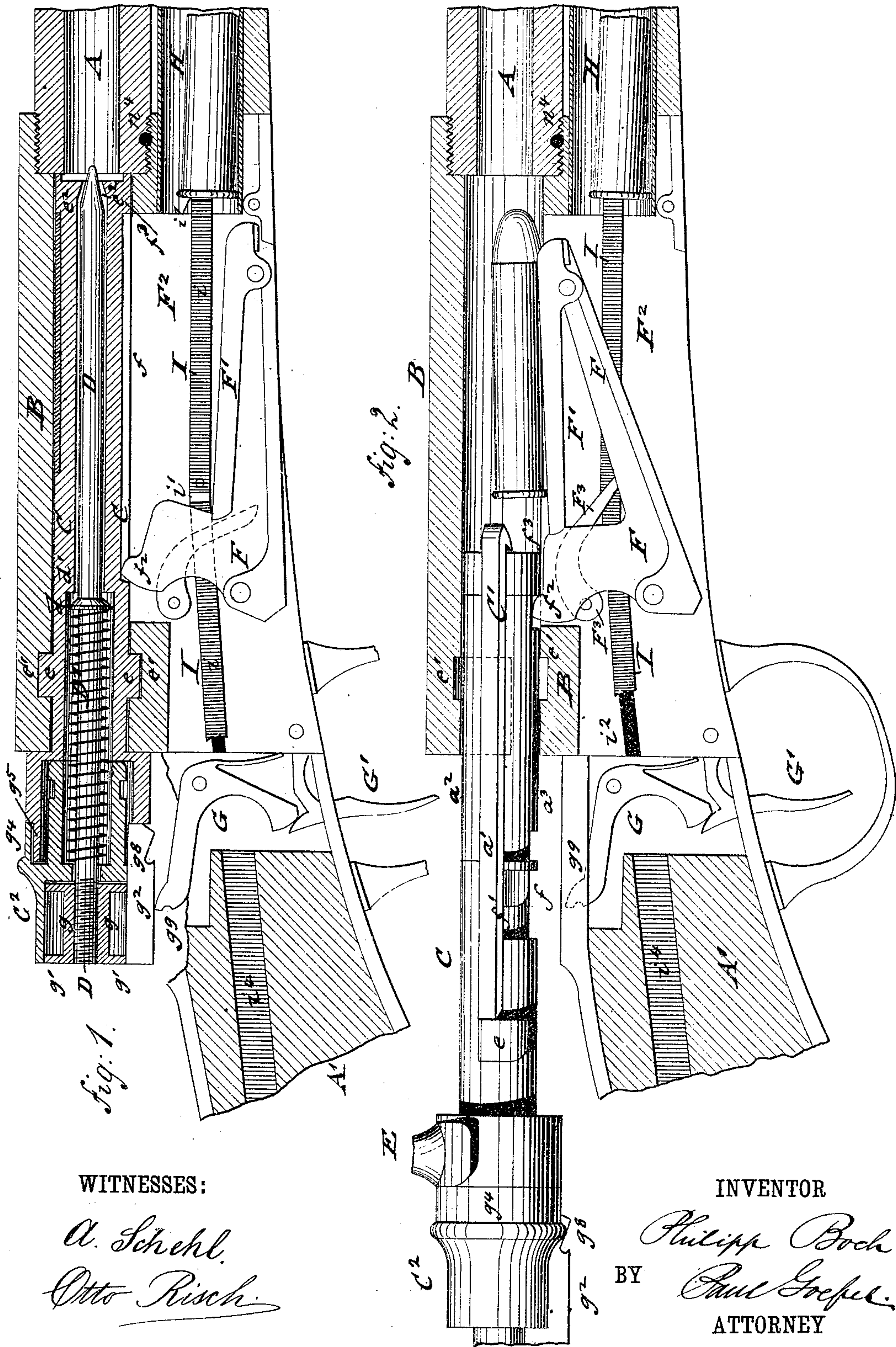


4 Sheets—Sheet 1.

No. 287,090.

Patented Oct. 23, 1883.



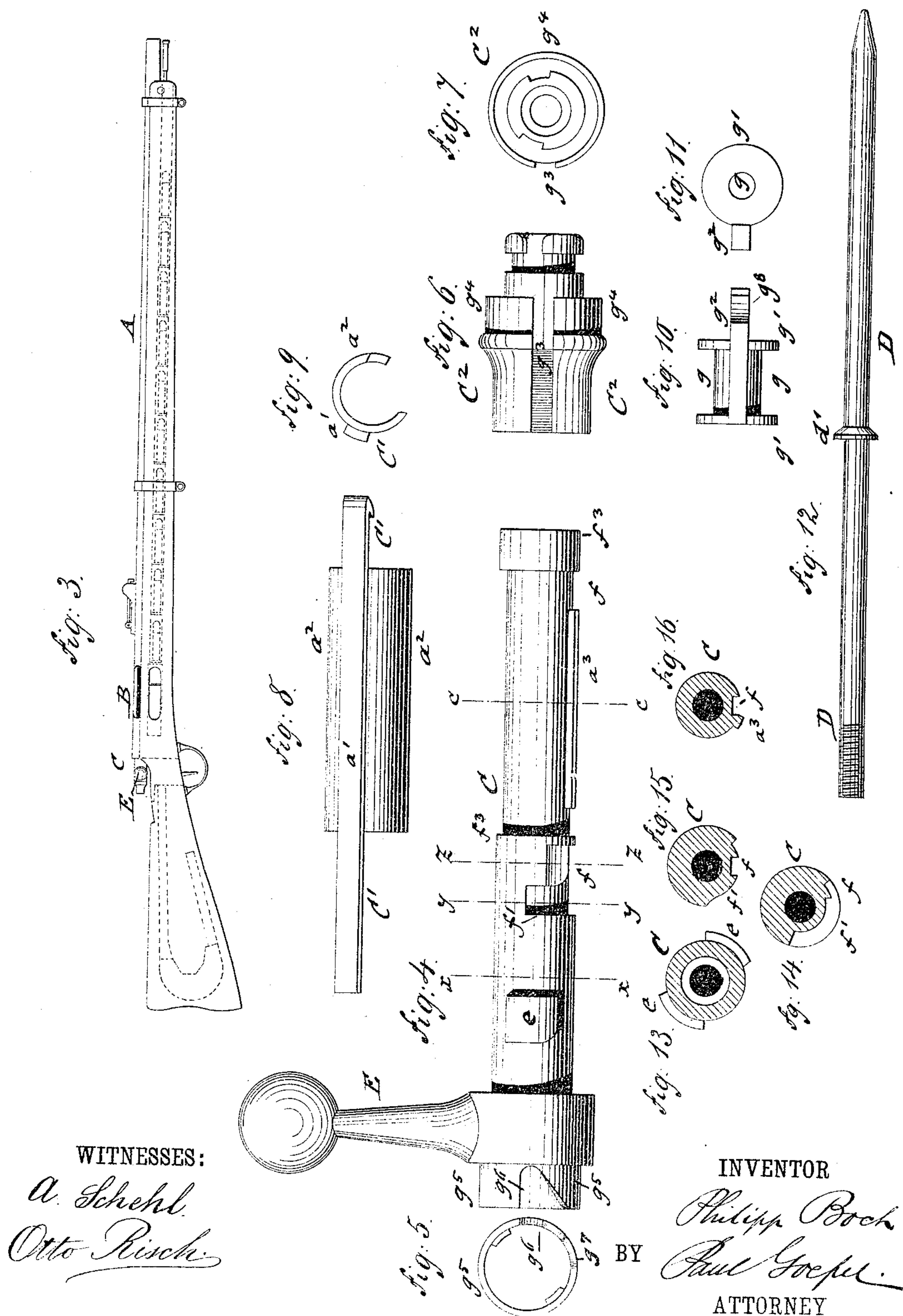
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MAGAZINE FIRE ARM.

No. 287,090.

Patented Oct. 23, 1883.



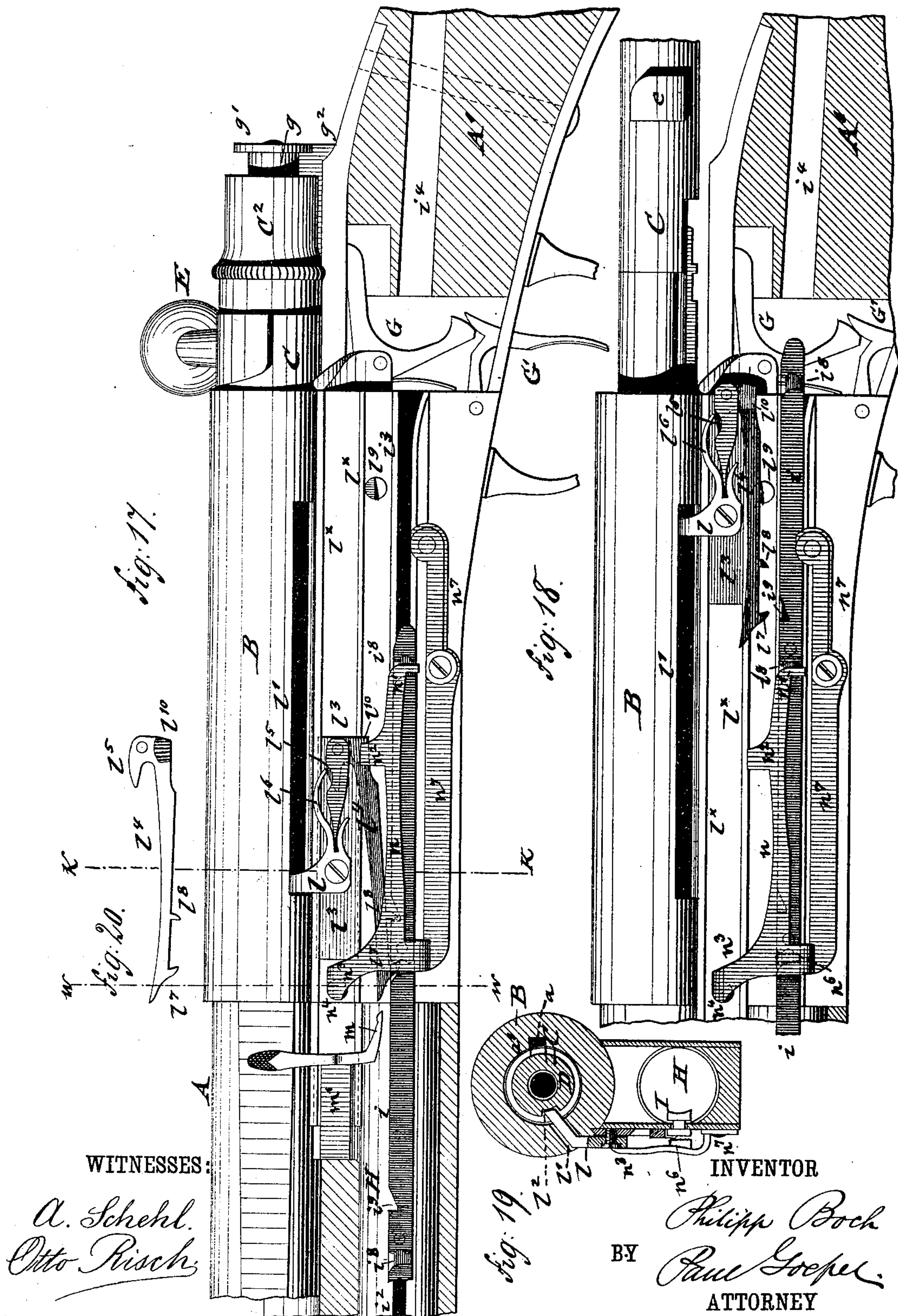
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No. 287,090.

Patented Oct. 23, 1883.

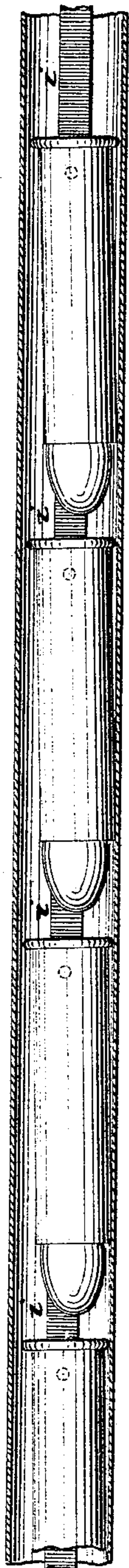


fig. 22.

H

WITNESSES:

A. Schehl.
Otto Risch.

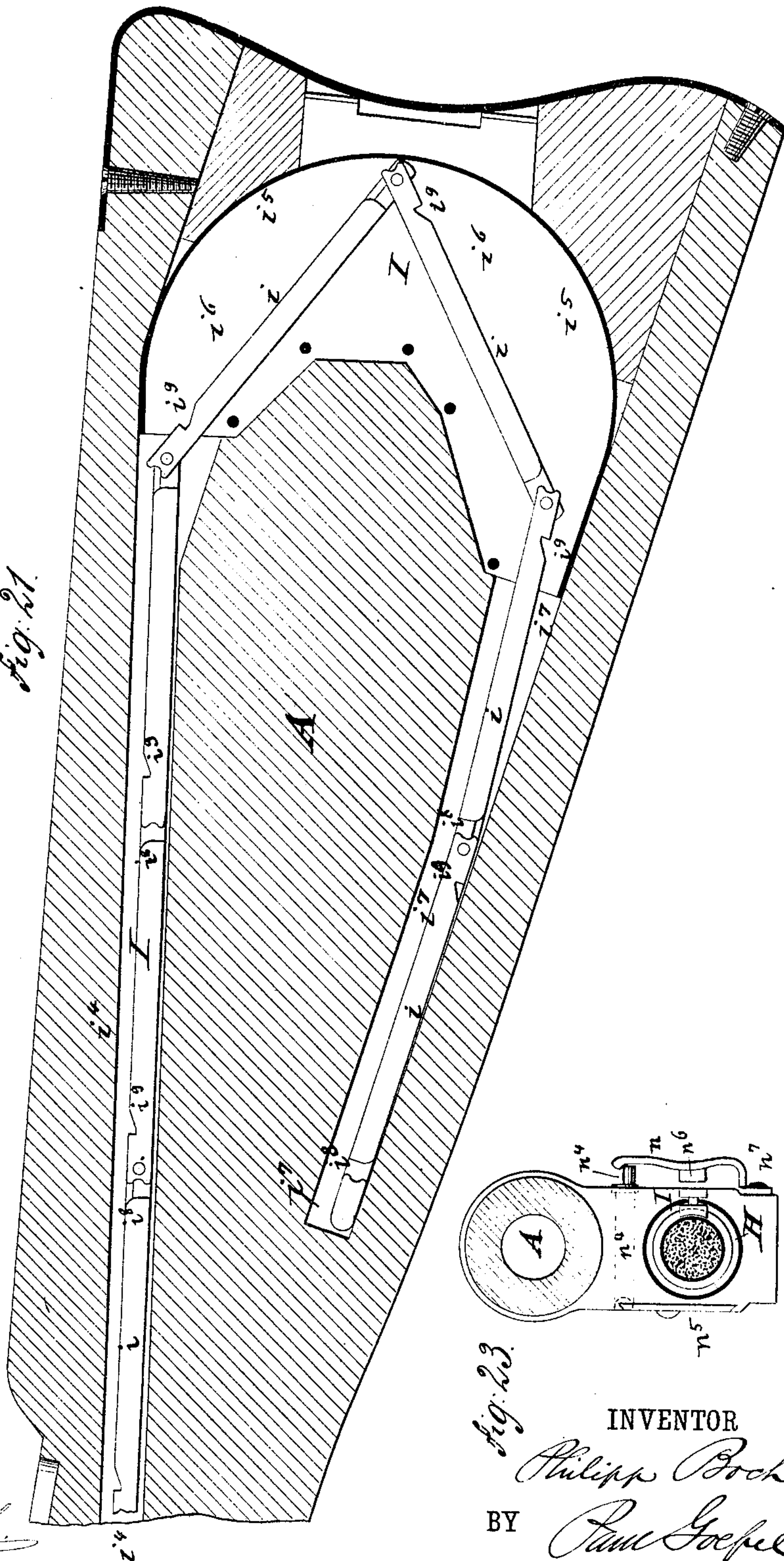


Fig. 21.

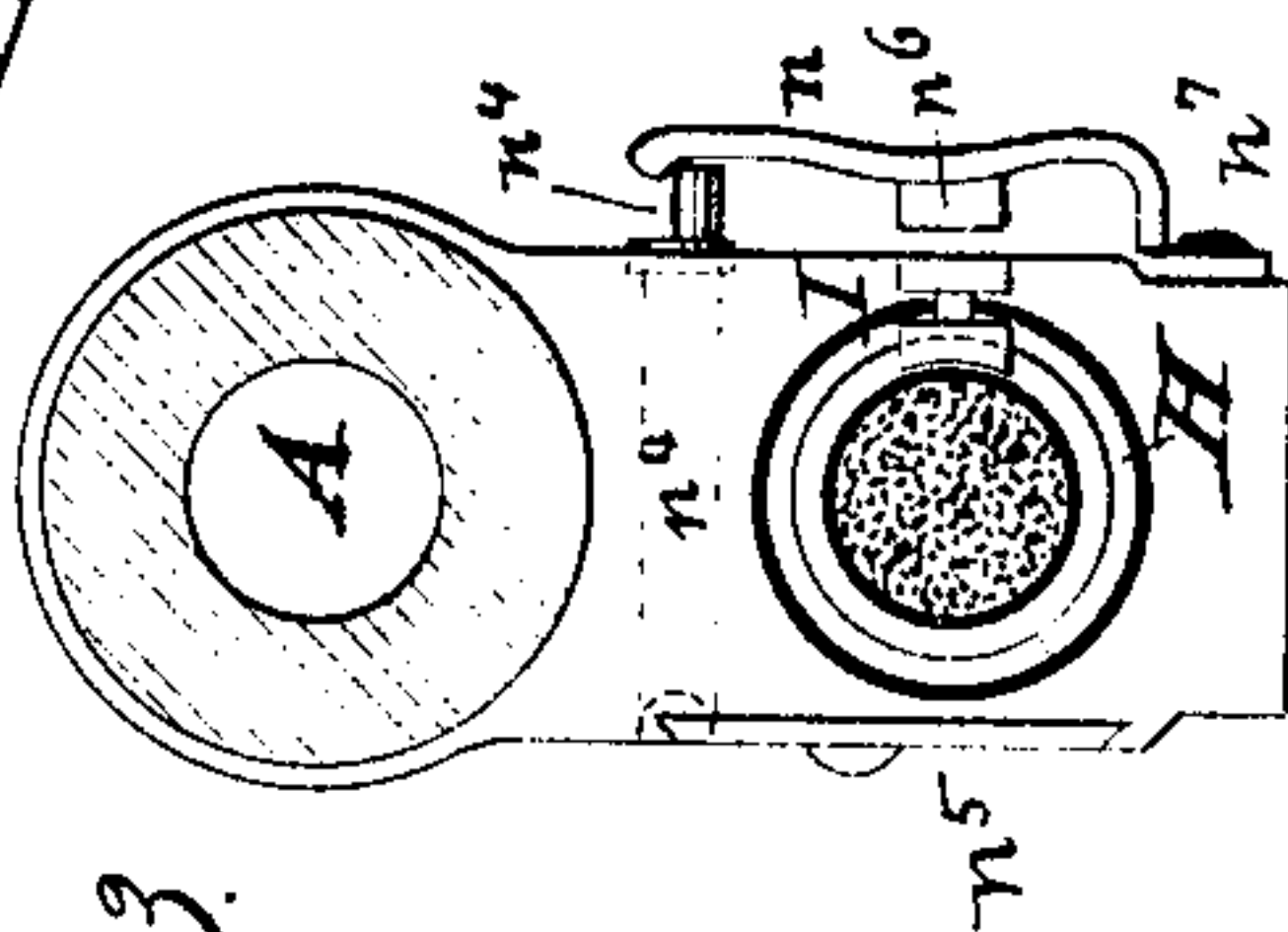


Fig. 23.

INVENTOR

Philipp Boch

BY

Paul Goepfer

ATTORNEY

UNITED STATES PATENT OFFICE.

PHILIPP BOCH, OF NEW YORK, N. Y.

MAGAZINE FIRE-ARM.

SPECIFICATION forming part of Letters Patent No. 287,090, dated October 23, 1883.

Application filed March 19, 1883. (No model.)

To all whom it may concern:

Be it known that I, PHILIPP BOCH, of the city, county, and State of New York, have invented certain new and useful Improvements in Magazine Fire-Arms, of which the following is a specification.

This invention has reference to certain improvements in the magazine fire-arm for which Letters Patent of the United States have heretofore been granted to me under date of February 20, 1883, No. 272,636, said improvements being designed, primarily, with a view to simplify the construction of the breech-bolt mechanism and to render the same more reliable and effective, and, secondarily, with a view to secure the regular forward feeding of the cartridges from the magazine to the barrel by means of a positive-motion feed, whereby any possibility of the accidental discharge of the cartridges in the magazine by sudden concussion of the gun is prevented and the entire feeding mechanism rendered more reliable and serviceable.

The invention relates more especially to improvements in that class of guns known as "bolt-guns," or guns having a breech-bolt and firing-pin; and it consists, first, of certain improvements in the construction of the breech-bolt, extractor, and firing-pin; and, secondly, in an improved construction of the magazine and the mechanism by which the cartridges are fed forward in a positive manner, without the employment of spring-pressure, to the cartridge-well and from the same into the barrel.

It consists, further, of certain details of construction, as will more fully be described hereinafter, and finally be pointed out in the claims.

In the accompanying drawings, Figures 1 and 2 represent vertical longitudinal sections of my improved magazine fire-arm, showing it respectively after it has been fired off and with breech-bolt drawn back and in position ready for charging a new cartridge. Fig. 3 is a side view of the entire fire-arm and its magazine. Figs. 4 to 12 are details of the parts composing the breech-bolt, together with the extractor and firing-pin. Figs. 13 to 16 are vertical transverse sections of the breech-bolt on lines *x x*, *y y*, *z z*, and *c c*, Fig. 4. Figs. 17 and 18 are side elevations of my magazine fire-arm, taken from the opposite side to that shown

by Figs. 1 and 2, and showing the mechanism for feeding the cartridges from the magazine to the receiver. Fig. 19 is a vertical transverse section on line *k' k'*, Fig. 17. Fig. 20 is a detail view of the pawl or dog that engages the slide-chain for feeding the cartridges forward. Fig. 21 is a detail vertical longitudinal section through the butt of the fire-arm, showing the disposition of the cartridge-feeding chain within the interior of the same. Fig. 22 is a detail vertical longitudinal section through the magazine, showing the connection of the cartridges with the cartridge-feeding chain; and Fig. 23 is a vertical transverse section through the barrel and the magazine, taken on line *w w*, Fig. 17.

Similar letters of reference indicate corresponding parts.

Referring to the drawings, A represents the barrel, B the receiver or shoe at the breech end of same, and C the sliding breech-bolt, which is accurately fitted to the interior of the receiver, inserted into the same through the rear end, and guided by the shank *a'* of the extractor C' in a longitudinal groove, *a*, at the interior of the receiver B. The extractor C' is applied by a segmental spring-clamp, *a''*, to the front part of the breech-bolt C, the breech-bolt turning around its axis independently of the spring-piece *a''* in one or the opposite direction until a projecting tongue, *a'''*, of the breech-bolt C abuts against one of the ends of the spring-piece, as shown in Figs. 4 and 16. The breech-bolt C is made of a tubular exterior portion, and provided at its interior with a spring-acted firing-pin, D. The rear end of the breech-bolt C is closed by a tubular socket-piece, C', which is secured thereto by a bayonet-joint, said socket-piece C' extending into the breech-bolt and forming the seat for a spiral spring, D', that actuates the firing-pin D when its rear part is released by the action of the trigger. The front end of the spiral spring D' bears on a collar, *d*, which also serves to stop the firing-pin when thrown forward by contact with an interior shoulder, *d'*, of the tubular breech-bolt C, as shown in Fig. 1. The spiral spring D' serves to throw the firing-pin D forward after the breech-bolt has been drawn back and the firing-pin has been set in proper position for firing. The rear end of the breech-bolt C

is provided with a fixed actuating-lever, E, by means of which the breech-bolt is operated in the customary manner in bolt-guns. In front of the lever E the breech-bolt C has cams or projections *e e*, that lock in the nature of a bayonet-joint into interior grooves or recesses *e' e'* of the receiver B, said grooves being made in the shape of an L, the longer longitudinal extensions admitting the drawing back of the breech-bolt whenever a new cartridge is to be inserted into the receiver. The breech-bolt C is further provided at its middle part with a longitudinal groove, *f*, that runs sidewise of the projecting tongue *a*³, said groove having an L-shaped extension, *f'*, at its rear end. Into said groove *f f'* projects the upper end, *f*², of an elbow-lever, F, by which the cartridge-carrier F' is actuated, as shown in Figs. 1 and 2, the short lateral extension *f'* of the groove *f* admitting the axial turning of the breech-bolt C on the projection *f*² when the bolt has been locked into position in the receiver B. The front end of the breech-bolt C has a central tapering opening, *e*², for the tapering end of the firing-pin, through which the same is thrown for striking and exploding the primer of the cartridge. When the breech-bolt C is turned around its axis in the receiver by the lever E, so that the latter assumes an upward direction, as shown in Figs. 2 and 4, the cams *e* are in line with the longitudinal extensions of the recesses *e' e'* of the receiver B, and admit the pulling back of the breech-bolt in the direction of the longitudinal axis of the barrel. To the rear end of the firing-pin D is securely applied a sleeve, *g*, with disks *g'* and a longitudinal tongue, *g*², which latter is guided in a groove, *g*³, of the socket-piece C², while the sleeve-shaped rear parts of the socket-piece C² serve to guide the disks *g'*, which parts are clearly shown in Figs. 1, 10, and 11. The socket-piece C² is also provided with a forward-extending sleeve, *g*⁴, between which and the body of the socket is formed an annularly-grooved space for the rear end, *g*⁵, of the breech-bolt, said rear end, *g*⁵, being provided with an inclined recess, *g*⁶, into which the tongue *g*², at the rear end of the firing-pin, is moved by the spiral spring D' at the moment when the connection of the socket-piece C² and breech-bolt C by the bayonet-joint is made. The inclined side of the recess *g*⁶ serves also, when the breech-bolt is turned by its lever E to move the tongue *g*², and thereby the firing-pin D, backward against the tension of its spring, and to set it into a smaller recess, *g*⁷, by which the firing-pin is retained in partly drawn-back position. When the breech-bolt C has been drawn back to its full extent and the cartridge placed in front of the same, it is pushed forward again, and thereby a notch, *g*⁸, of tongue *g*² at the rear end of the firing-pin D engaged by the upper end, *g*⁹, of an intermediate fulcrumed and spring-pressed trigger-piece, G, (shown in Figs. 1 and 2,) and by the action of the same on the tongue *g*², the latter and the firing-pin

are drawn back entirely by the final forward and axial locking motion of the spring-bolt, so as to be ready for firing on pulling the trigger G'.

From the foregoing it will appear that the breech-bolt is composed of only six parts—the tubular breech-bolt C, the extractor C', and its spring-piece *a*², the socket-piece C², the firing-pin D, the sleeve *g* at the rear end of the firing-pin, and the spiral spring D'. When the breech-bolt C is removed entirely from the receiver or shoe B, the parts may be readily disengaged from each other in case any one requires cleaning or repairing. The spiral spring facilitates the separating of the socket-piece C² from the breech-bolt, whenever the bayonet-joint between them is disconnected. The sleeve *g* is next unscrewed from the firing-pin D, and thereby the socket-piece and spiral spring detached from each other. This simple construction of the breech-bolt, with its firing-pin and extractor, forms one of the essential features of my improved magazine-gun.

Below the barrel A is arranged a supplementary barrel or magazine, H, and at the rear end of the same, below the receiver, the cartridge-well F², in which the oscillating carrier F' and its fulcrumed actuating elbow-lever F are located. The solid end portion or collar, *f*³, at the front end of the groove *f* of the breech-bolt, engages the upper end, *f*², of the elbow-lever when the breech-bolt is drawn back, so as to raise thereby the elbow-lever F. The carrier F' is hinged at the front end to the front end of the elbow-lever F, and engaged at its rear end by a curved guide-piece, F³, that is pivoted to the wall of the cartridge-well F², and guided by its lower end along a longitudinal side rib of the elbow-lever F. The rear end of the carrier F' moves along the curved guide-piece F³, and is raised by the elbow-lever F until the carrier assumes a position parallel to the axis of the main barrel, as shown in Fig. 2. The simultaneous motions of the elbow-lever F, guide-piece F³, and carrier F', produced by the backward motion of the breech-bolt, cause the cartridges to be moved into the receiver and into line with the breech-bolt and the barrel, ready to be moved forward into the barrel by the forward motion of the breech-bolt, as shown in Fig. 2. When the breech-bolt has nearly completed its forward motion, the upper end of the elbow-lever strikes against the rear end of slot *f*, and returns thereby the elbow-lever, carrier, and guide-piece into their normal position at the lower part of the cartridge-well, as shown in Fig. 1, in which position the carrier is in position to receive the next cartridge from the magazine H, as will appear more fully by reference to the patent heretofore referred to, in which this construction has been specially described and claimed.

The cartridges are not fed forward from the magazine H by a spiral spring, as has been customary heretofore, but by means of a cartridge-feeding chain, I, that is composed of a number of individual links, *i i*, which are piv-

oted together, each link being provided with a vertical interior side recess, i' , of such size that the rim at the base of the cartridge readily fits into the same. The links i of the cartridge-carrying chain I are made of double T-shaped cross-sections, so as to form top and bottom grooves, by which said links are guided in a longitudinal slot, i^2 , of the magazine H, and by a longitudinal slot, i^3 , in the side wall of the cartridge-well F^2 , which slot forms an extension of the slot i^2 , as shown in Figs. 17 and 18. From the guide-slot i^3 the links i are delivered to a longitudinal extension-channel, i^4 , in the butt A' of the gun. The channel i^4 is made larger in the wider part of the butt A' , so as to form, in connection with the semicircular guide-plate i^5 , an enlarged cavity, i^6 , which has at its lower end a forward-extending channel, i^7 . The length of the channel i^4 , cavity i^6 , and extension-channel i^7 corresponds to the length of the cartridge-feeding chain I, so that the same can be gradually fed to and stored away in the butt of the gun, as the cartridges are successively fed to the barrel, as shown in Fig. 21.

The mechanism by which the cartridge-feeding chain I is moved back, so as to supply successively the cartridges to the barrel, is shown clearly in Figs. 17 and 18, and consists of a curved dog, l , that projects through a longitudinal slot, l' , of the receiver B into a recess, l'' , of the breech-bolt C, the slot l' being located at that side at which the cartridge-feeding chain I is arranged. The dog l is firmly secured to a dovetailed slide-plate, l^3 , which moves longitudinally forward and backward in guides l^x , arranged at the outer side wall of the cartridge-well F^2 . To the slide-plate l^3 a pawl, l^4 , is pivoted, said pawl having an upward and forward extending part, l^5 , which is engaged by a spring, l^6 , that is preferably made integral with the dog l . By the pressure of the spring l^6 , the front end of the pawl l^4 is forced downward, so that a hook, l^7 , at its outer end is thrown into engagement with exterior side recesses, i^8 , of the cartridge-feeding chain I, while a second smaller hook, l^8 , that projects in opposite direction to the hook l^7 , engages a second notch, i^9 , at some distance from the side recess, i^8 , of each link i , and forms thereby a check device against the accidental release of the chain I by concussions caused in discharging or in handling the firearm. In other words, it forms a check device by which the chain I is held in position, together with the cartridges, and by which the regular forward motion of the chain I by the motion of the breech-bolt is secured in the manner described.

When the breech-bolt C is drawn back for setting the firing-pin and supplying a new cartridge to the barrel by the carrier, the dog l , pawl l^4 , and the cartridge-feeding chain I are moved back for the distance of one link, so as to place a cartridge in position on the carrier F' , which is then lifted by the final backward motion of the breech-bolt into the receiver, as

before described. When the pawl l^4 has arrived at its rearmost position, its hooks l^7 l^8 are lifted out of the side recess, i^8 , and notch i^9 of the link by contact with a fixed and partly-recessed stud, l^9 , as shown in Fig. 18. The pawl l^4 is thereby disengaged from the link, so as to move forward with the breech-bolt C until the pawl clears the stud l^9 and drops into the recess and notch of the next succeeding link of the chain, ready for the next backward motion of the breech-bolt. As the links of the cartridge-feeding chain I are of slightly greater length than the cartridges, and as the rims of the latter are retained by the inner side recesses of the chain, the cartridges can never touch each other, but are separated in the magazine as well as in the cartridge-well by small intermediate spaces, as will appear clearly by reference to Fig. 22, so that consequently no accidental discharge of the cartridges in the magazine and damage to the firearm in consequence thereof can ever take place. As the cartridges are successively fed to the barrel, the links of the chain I are moved into the storage-channel and cavity of the butt until, when the last cartridge is delivered to the barrel, the first link of the chain arrives at the end of the extension-channel of the butt, as shown in Fig. 21. It is now necessary to move the entire chain I back into the magazine, together with a new set of cartridges, for which purpose a lifting-hook, m , that is applied to a dovetailed slide-plate, m' , moving in extensions of the guideways l^x l^x , is pushed backward, so that its pointed lower end engages the tapering front end of pawl l^4 and lifts the same out of engagement with the link. As many cartridges as can be stored in the magazine are now, one after the other, inserted through the charging-opening in the opposite side wall of the cartridge-well, so that the rims of the cartridges engage the inner side recesses, i' , of the links i , and move thereby with the chain into the magazine until the same is charged to its full extent with its proper complement of cartridges, as shown in Fig. 3. As the chain I has to be retained in position without moving during the interval of time when the pawl l^4 is released from the recesses of the link i at the beginning of the backward motion of the breech-bolt, a spring-check, n , enters by its hook-shaped rear end, n' , into the outer side recess, i^8 , of the links i , and holds thereby the chain rigidly in position, as shown in Fig. 18. The spring-check n is furthermore provided with an upwardly-extending part, n^2 , near the end hook, n' , which part is engaged by a projecting check, l^{10} , at the rear end of the pawl l^4 , as shown clearly in Figs. 18 and 20, so that the spring-check n is pressed in outward direction whenever the check l^{10} engages the part n^2 , which causes the clearing of the outer side recesses of the links i by the hook-shaped rear end, n' , of the spring-check n and the dropping of the hooks of the pawl l^4 into the side recess i^8 and notch i^9 of the next link i of the chain by the action

of spring l^6 and the bent end l^6 of the pawl l^4 . The opposite end of the spring-check n has an upward extension, n^3 , which is engaged by a transverse pin, n^4 , that passes near the breech end of the barrel from one side of the same to the other, as shown in Figs. 1, 2, 17, 18, and 23. The opposite projecting end of the pin n^4 is engaged or released by a slide-plate, n^5 , that moves in dovetailed guideways at the opposite side of the gun. When the pin n^4 is pressed by the slide-plate against the extension n^3 , the spring-check n is forced away from the links of the chain I, so that a projection, n^6 , of the extension n^3 clears the links; but when the slide-plate n^5 is pushed clear of the projecting end of the pin n^4 , the projection n^6 at the inside of the spring-check is caused to engage the outer side recess, i^3 , of the links of the chain I, so that thereby the cartridge-feeding chain I and the cartridges are prevented from changing their position, while the pawl l^4 is also prevented from engaging the recessed links of the chain I and moving the same backward with the cartridges.

In the last-described position of the spring-check n the fire-arm can only be used for single-firing, the slide-plate n^5 being moved backward whenever the order for single-firing is given. In this case one cartridge after the other is inserted, in the usual manner, through the side opening to the carrier, the magazine and cartridge-feeding mechanism being locked and thrown out of operation for the time being. The moment the order for magazine-firing is given, the slide-plate n^5 is pushed forward, so as to press the pin n^4 laterally and release the projection n^6 from the recess of the link i of the chain I. The cartridge-feeding mechanism is now ready for operation, and supplies with each backward motion of the breech-bolt a cartridge to the carrier and to the barrel, so that as many shots can be rapidly fired in succession as there are cartridges in the magazine. The spring-check n is secured by its longer base portion n^7 , at two points near its rear end, to the lower part of the outer side wall of the cartridge-well, as shown clearly in Figs. 17 and 18, so that the upper or check part proper has the required degree of spring action, for which purpose the entire spring-check n and the base part are made of one piece of the best spring-steel, so as to properly perform its work.

The magazine and its cartridge-feeding mechanism hereinbefore described are adapted for ten cartridges, which, with one on the carrier and one in the barrel, admits twelve shots in succession.

When the fire-arm is not intended for military purposes, the magazine H, below the barrel A, may be dispensed with, and a smaller magazine capable of storing six cartridges arranged in the butt, in which case the cartridge-feeding chain is not made of links that are hinged together, but simply of one straight continuous piece, which is, however, provided with the same interior and exterior recesses as

those that have been described in connection with the linked chain. The cartridges, instead of moving backward from the magazine to the well, are then moved in forward direction from the butt to the well, the cartridge-feeding mechanism being then so connected to the breech-bolt that the feeding of the cartridges take place with the forward motion of the breech-bolt, instead of with the backward motion. This latter form, owing to its greater lightness, may be better adapted for sporting purposes, as the weight of the fire-arm is decreased.

The operation of the breech-bolt is about the same as that of the breech-bolt in the magazine-gun heretofore patented to me, it being adapted for either single or magazine firing, as required. The cartridges are fed in through the opening of the cartridge-well, and the empty shells thrown out by the extractor through the side opening of the receiver B, while the next cartridge is lifted at the same time by the carrier into line with the breech-bolt and barrel. The breech-bolt is first turned around its axis by its lever, so as to partly set the firing-pin, then pulled back so as to lift the cartridge in the cartridge-well and feed at the same time another cartridge into the well by the action of the cartridge-feeding mechanism. The breech-bolt is then moved forward again, whereby the entire setting of the firing-pin is produced by the trigger-piece. The breech-bolt is next locked to the receiver by being turned around its axis, after which the gun is ready for firing on pulling the trigger. The operations described are repeated until the magazine is exhausted.

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

1. The combination, substantially as set forth, of a receiver, B, having an interior longitudinal guide-groove, a breech-bolt, C, having a shoulder, f^3 , and a longitudinal rib, a^3 , back of said shoulder, and an extractor, C', having a spring-plate, a^2 , embracing said breech-bolt, and a guide-tongue or shank adapted to move in the longitudinal guide-groove of the receiver, the spring-plate permitting the axial and longitudinal motion of the breech-bolt in said receiver.

2. The combination of the receiver B, tubular breech-bolt C, having recessed rear end g^5 , rear socket-piece, C', having recess g^3 , inclined on one side, spring-pressed firing-pin D, and guide-sleeve $g g'$, having tongue g^2 , whereby the firing-pin is partly set against the tension of its spring by the axial motion of the breech-bolt, substantially as specified.

3. The combination of the receiver B, breech-bolt C, having recessed rear end, g^5 , rear socket-piece, C', having longitudinal groove g^3 , inclined on one side, spring-pressed firing-pin D, guide-sleeve $g g'$, attached to rear end of the firing-pin and having a tongue, g^2 , and fulcrumed and spring-acted trigger-piece engaging notch g^4 of tongue g^2 , whereby the firing-pin is first partly set by the axial motion

of the breech-bolt, and finally completely set by the trigger-piece, substantially as described.

4. In a magazine-gun, the combination of the barrel, receiver, cartridge-well, and butt with a cartridge-feeding chain that is guided in longitudinal slots of the magazine, well, and butt, said chain engaging the rims of the cartridges, and with mechanism connected to the breech-bolt, whereby the cartridge-feeding mechanism and the cartridges are successively fed into the receiver by the action of the breech-bolt, substantially as set forth.

5. The combination of a longitudinally-slotted magazine, H, cartridge-well F², having guide-grooves i³, butt A', having channels i⁴ i⁵ and extension-channel i⁷, a cartridge-feeding chain, I, having interior side recesses, i', for engaging the rims of the cartridges, exterior side recesses, i⁸, and notches i⁹, a longitudinally-guided dog, l, passing through a guide-slot, l', of the receiver into a recess, l², of the breech-bolt C, a pivoted and spring-acted pawl, l⁴, having hooks l⁷ and l⁸, and retaining check-spring n, having rear hook, n', adapted to engage a notch or recess of the cartridge-carrying chain, substantially as and for the purpose set forth.

6. The combination of the slotted magazine H, cartridge-well F², having guide-slots i³, butt A', having interior channels, i⁴ i⁵ i⁷, a cartridge-feeding chain, I, guided in said slots and channels, and provided with interior side recesses, i', for engaging the rims of the cartridges, and with exterior side recesses, i⁸, and notches i⁹, a pivoted and spring-acted pawl, l⁴, connected to the breech-bolt and provided with hooks l⁷ l⁸ and projecting check l¹⁰, a projecting stud,

l⁹, and a check-spring, n, having rear hook, n', adapted to engage a notch or recess of the cartridge-carrying chain, and upwardly extending portion n², substantially as specified. 40

7. In a magazine-gun, the combination of the longitudinally-guided cartridge-feeding chain I, having an interior side recess, i', for the rims of the cartridges, exterior side recesses, i⁸, and notches i⁹, a pivoted pawl, l⁴, actuated by the breech-bolt, said pawl having hooks l⁷ l⁸ and check l¹⁰, a check-spring, n, having upwardly-extending portion n², and slide-hook m, whereby the pawl and check-spring are released from the chain when it is desired to move the chain forward for refilling the magazine, substantially as described. 50

8. The combination, in a magazine-gun, of a cartridge-feeding chain, I, a reciprocating pivoted pawl, l⁴, connected to the breech-bolt and provided with means for engaging the chain, a check-spring, n, having rear hooks, n', adapted to engage a notch or recess of the cartridge-carrying chain, upwardly-extending parts n² n³, and projection n⁶, a transverse sliding pin, n⁴, and a slide-plate, n⁵, at the opposite side of the gun, the slide-plate producing the locking of the chain by the spring-check when the gun is intended to be used for single-firing, substantially as specified. 55 60 65

In testimony that I claim the foregoing as my invention I have signed my name in presence of two subscribing witnesses.

PHILIPP BOCH.

Witnesses:

PAUL GOEPEL,
SIDNEY MANN.