

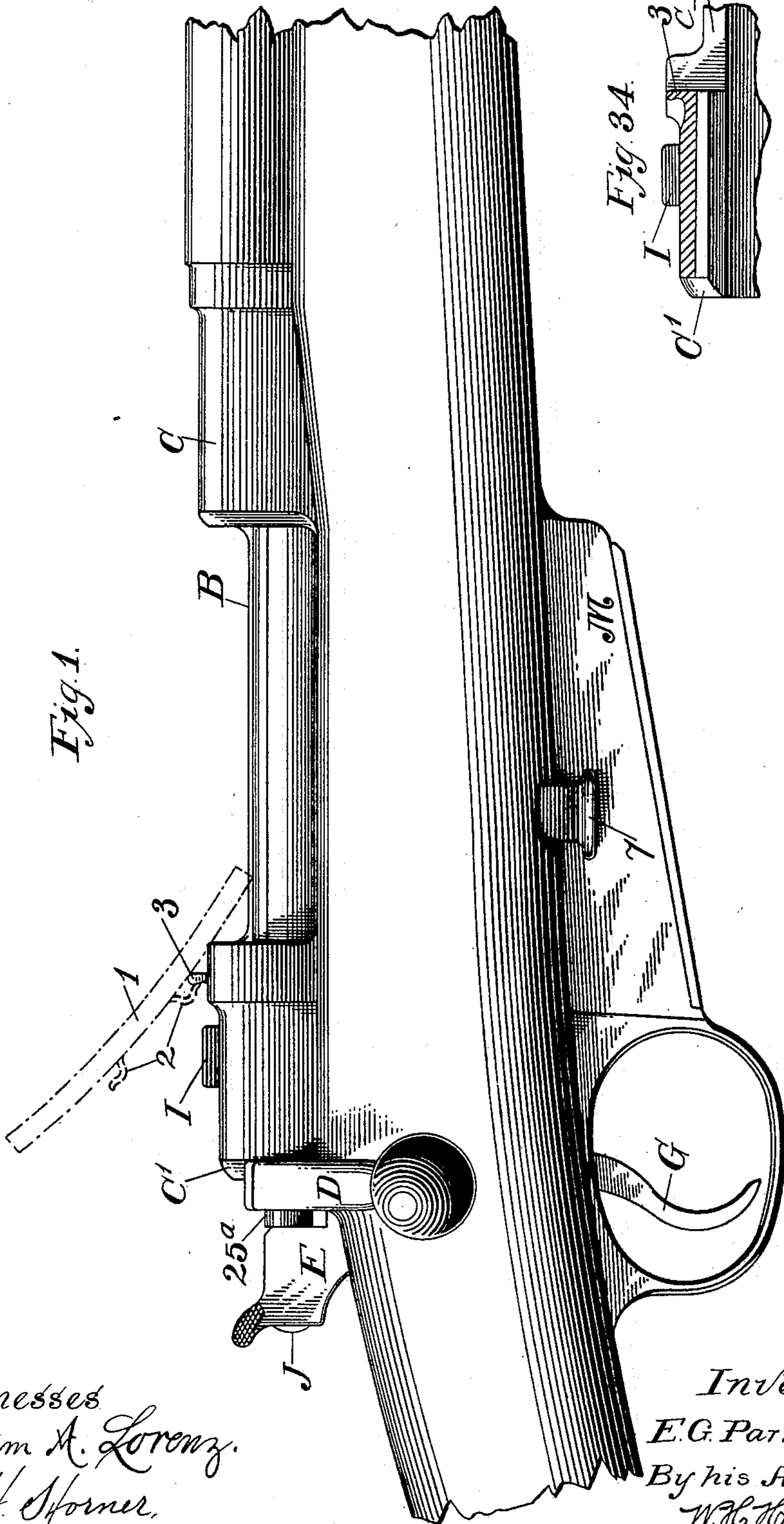
(No Model.)

7 Sheets—Sheet 1.

E. G. PARKHURST.  
MAGAZINE BOLT GUN.

No. 604,904.

Patented May 31, 1898.



Witnesses  
William A. Lorenz.  
L. H. Horner.

Inventor  
E. G. Parkhurst  
By his Attorney  
W. H. Honiss.

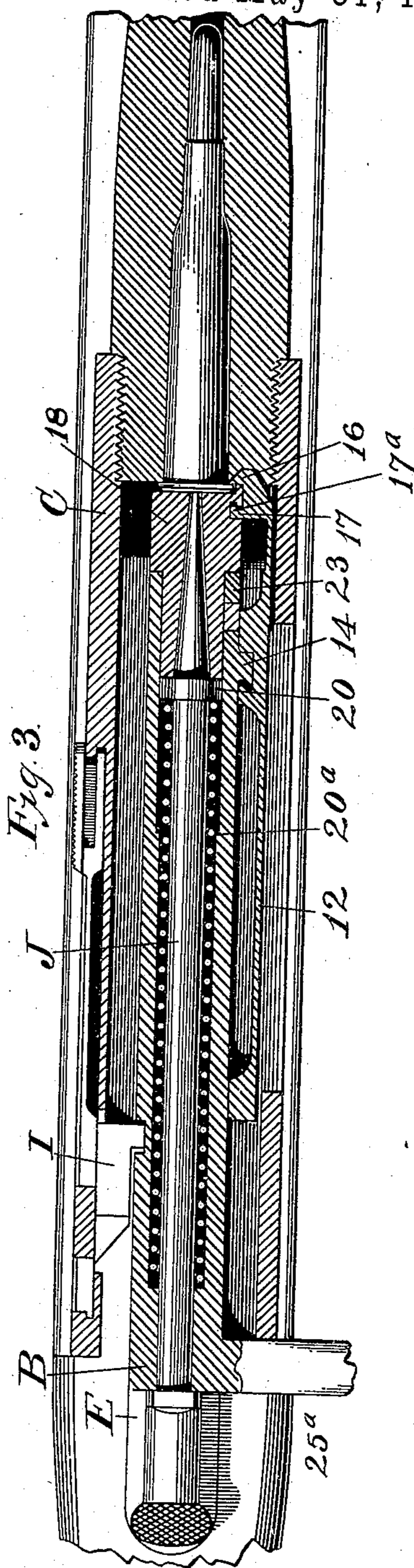
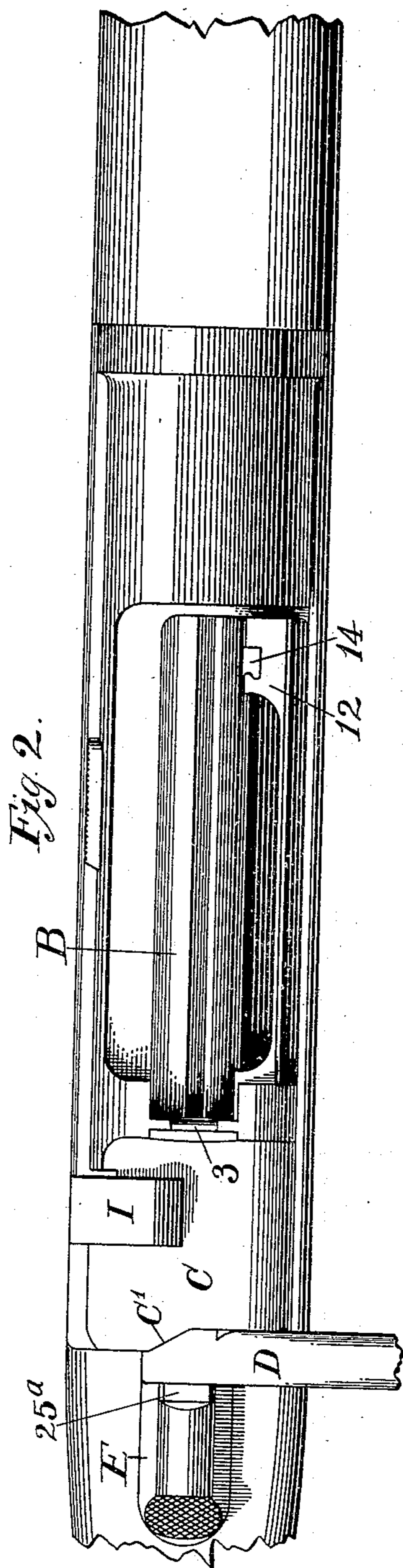
(No Model.)

E. G. PARKHURST.  
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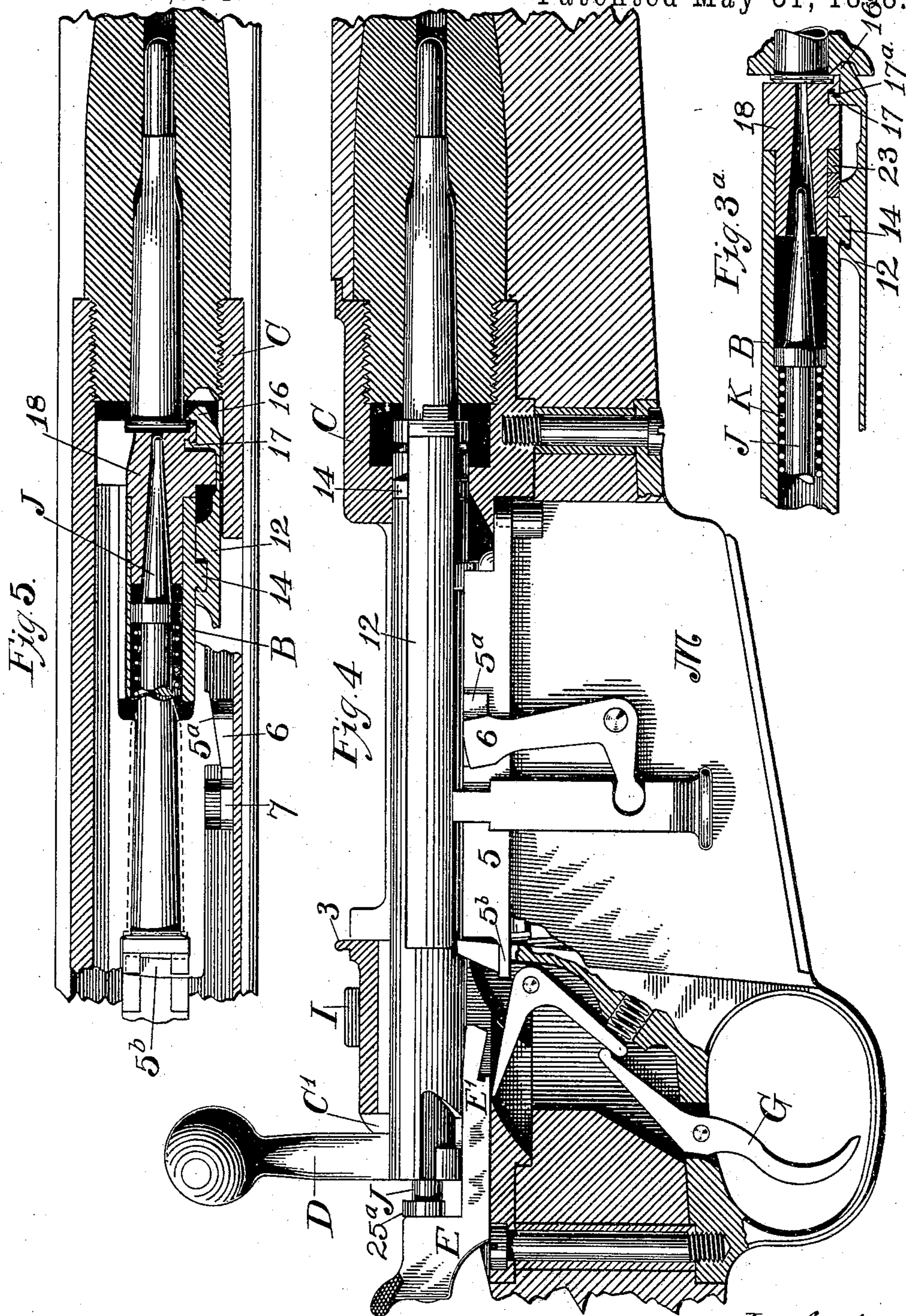
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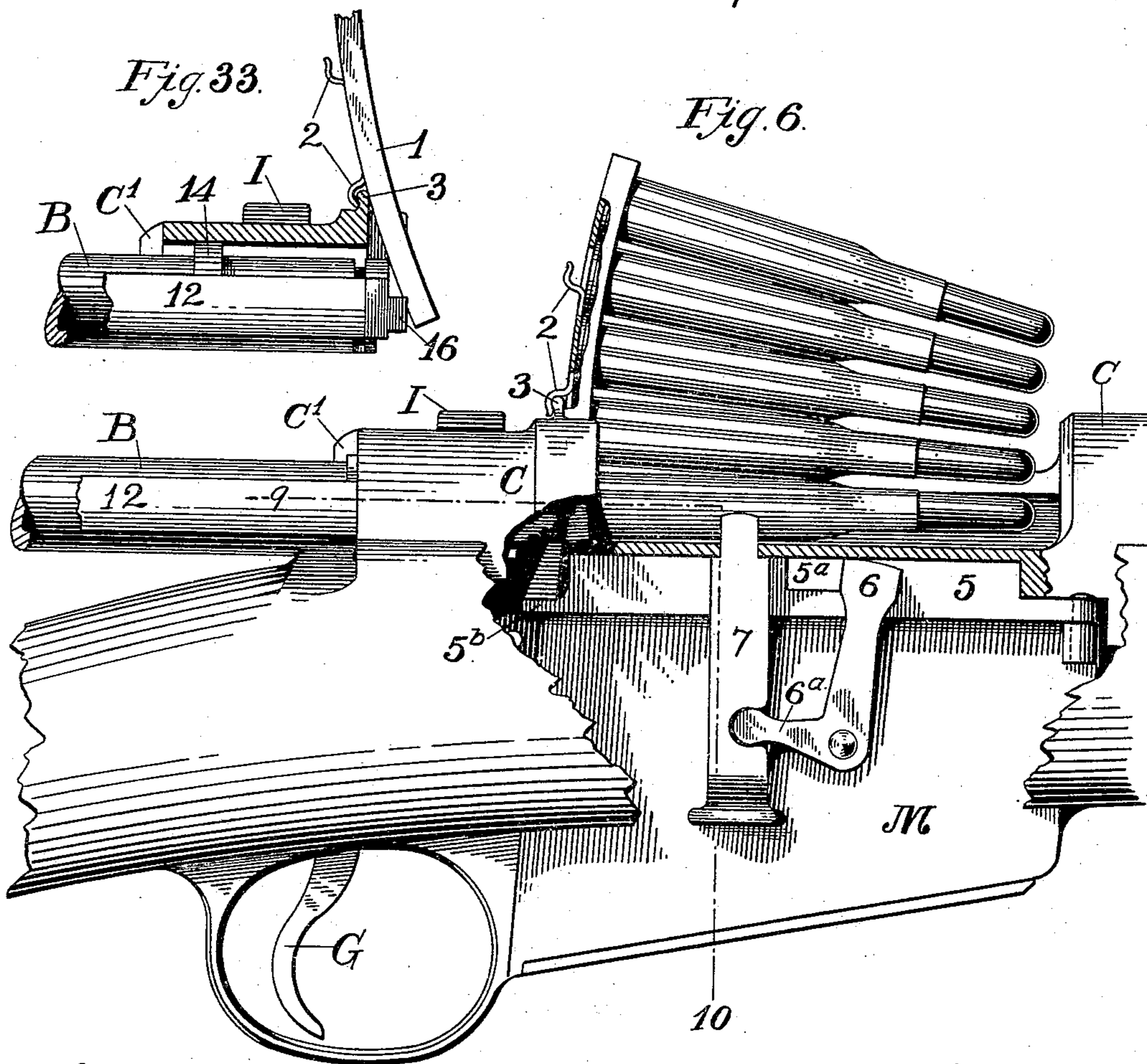
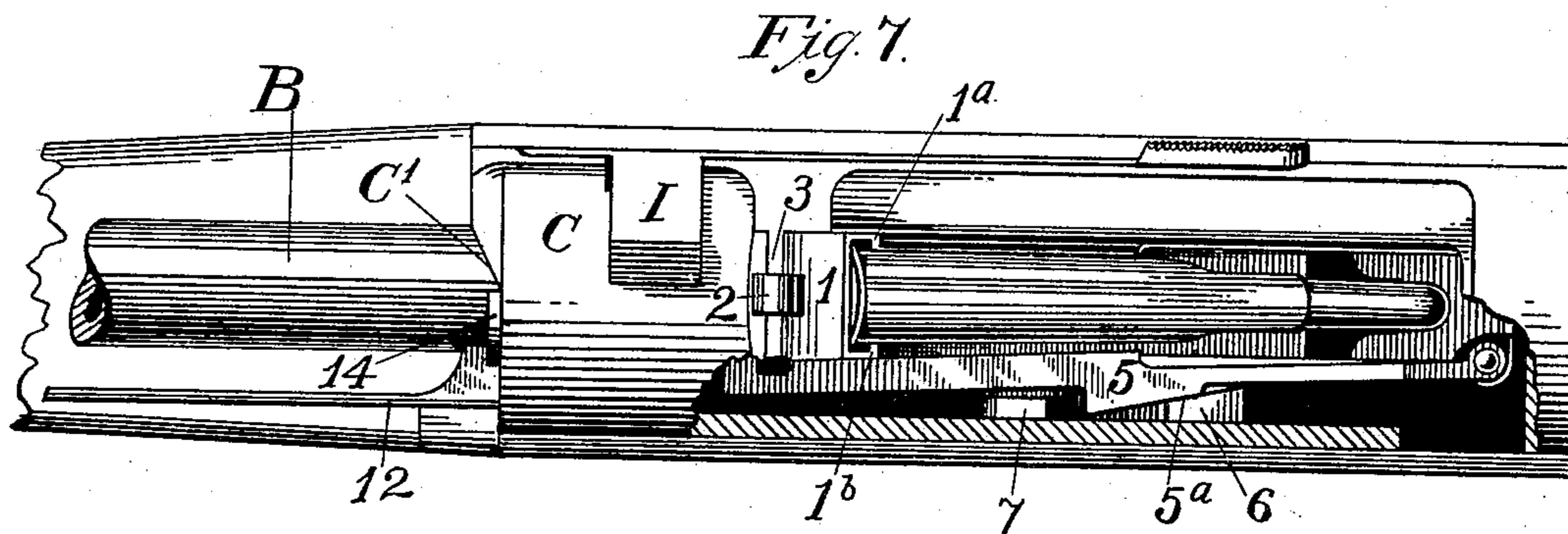
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E. G. PARKHURST.  
MAGAZINE BOLT GUN.

7 Sheets—Sheet 4.

No. 604,904.

Patented May 31, 1898.



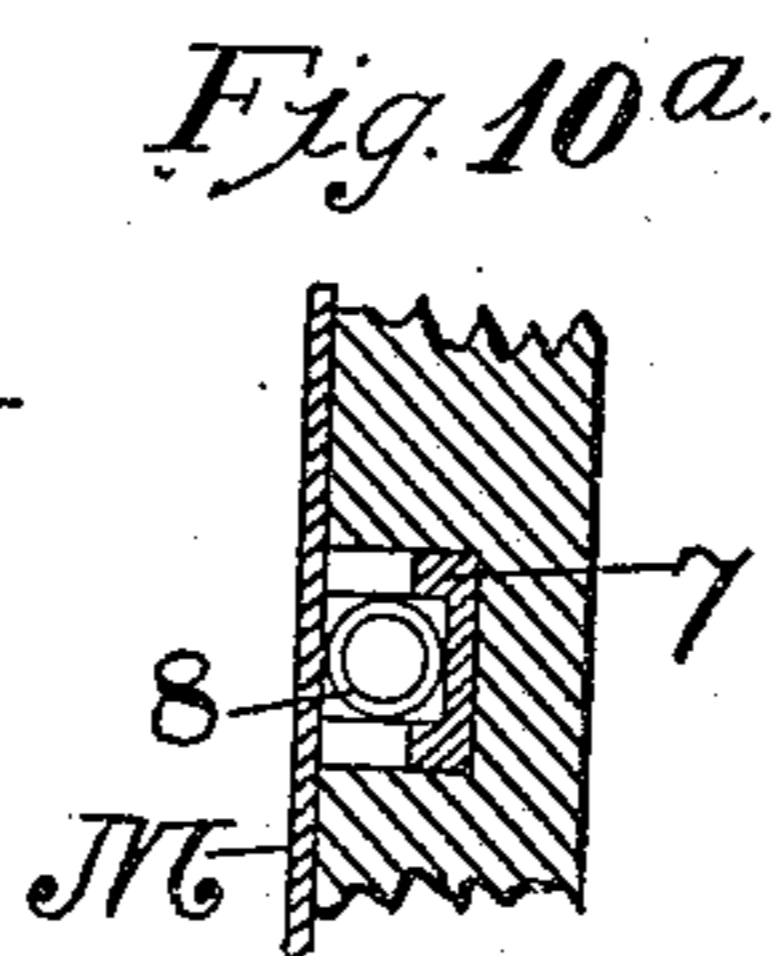
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(No Model.)

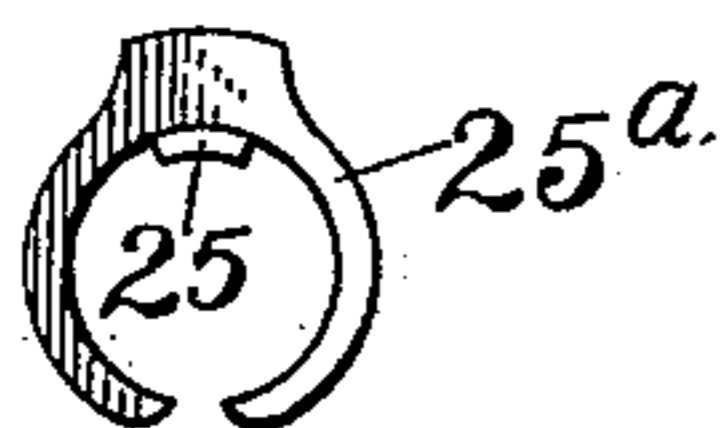
E. G. PARKHURST.  
MAGAZINE BOLT GUN.

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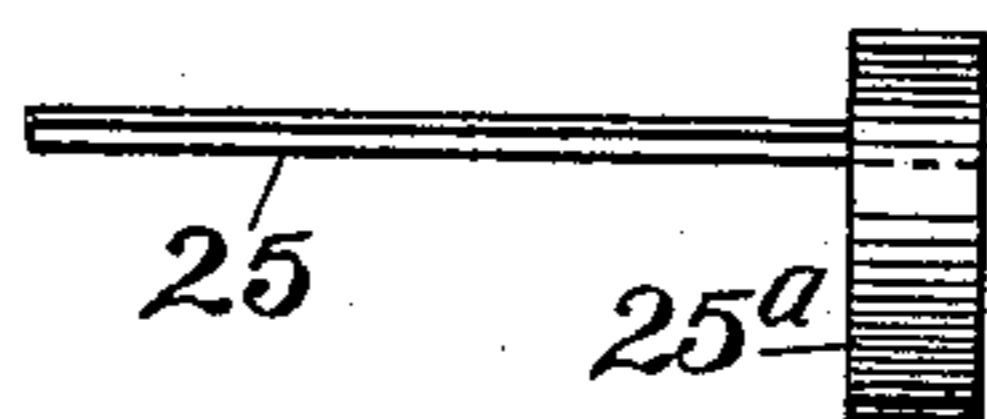
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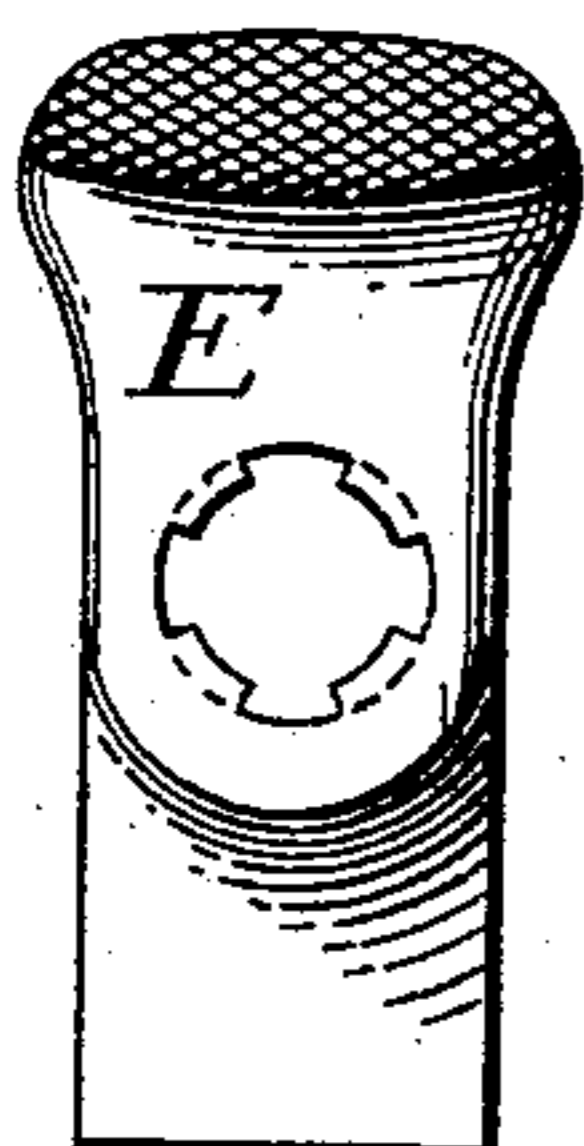
*Fig. 11.*



*Fig. 12.*



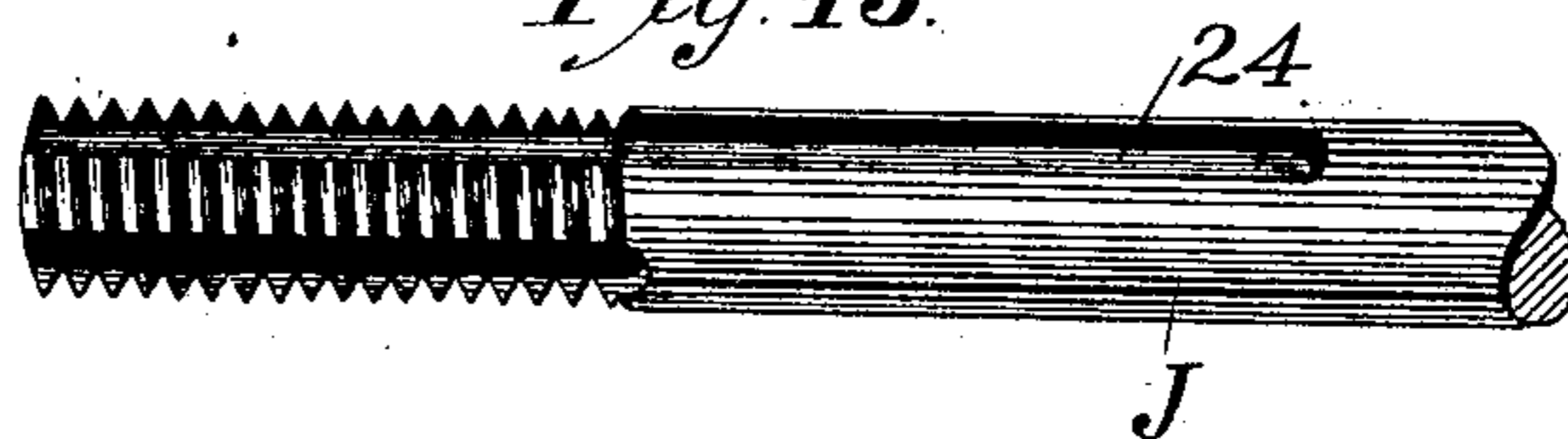
*Fig. 15.*



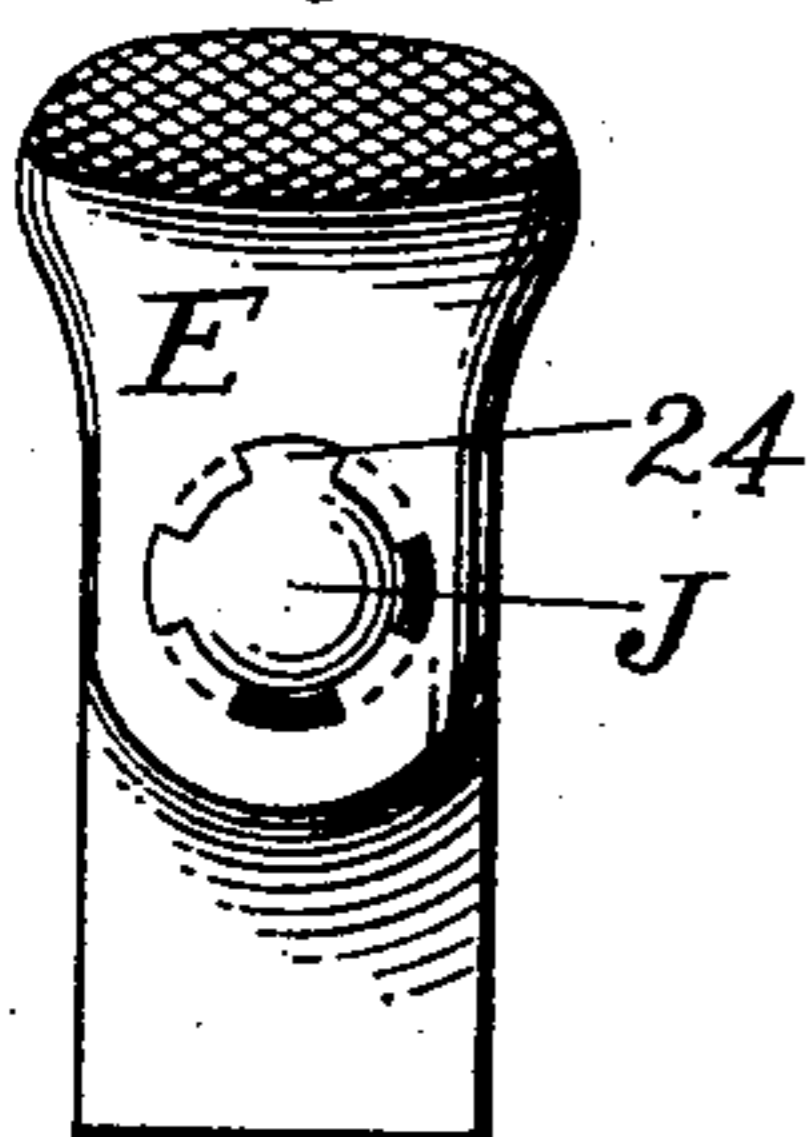
*Fig. 14.*



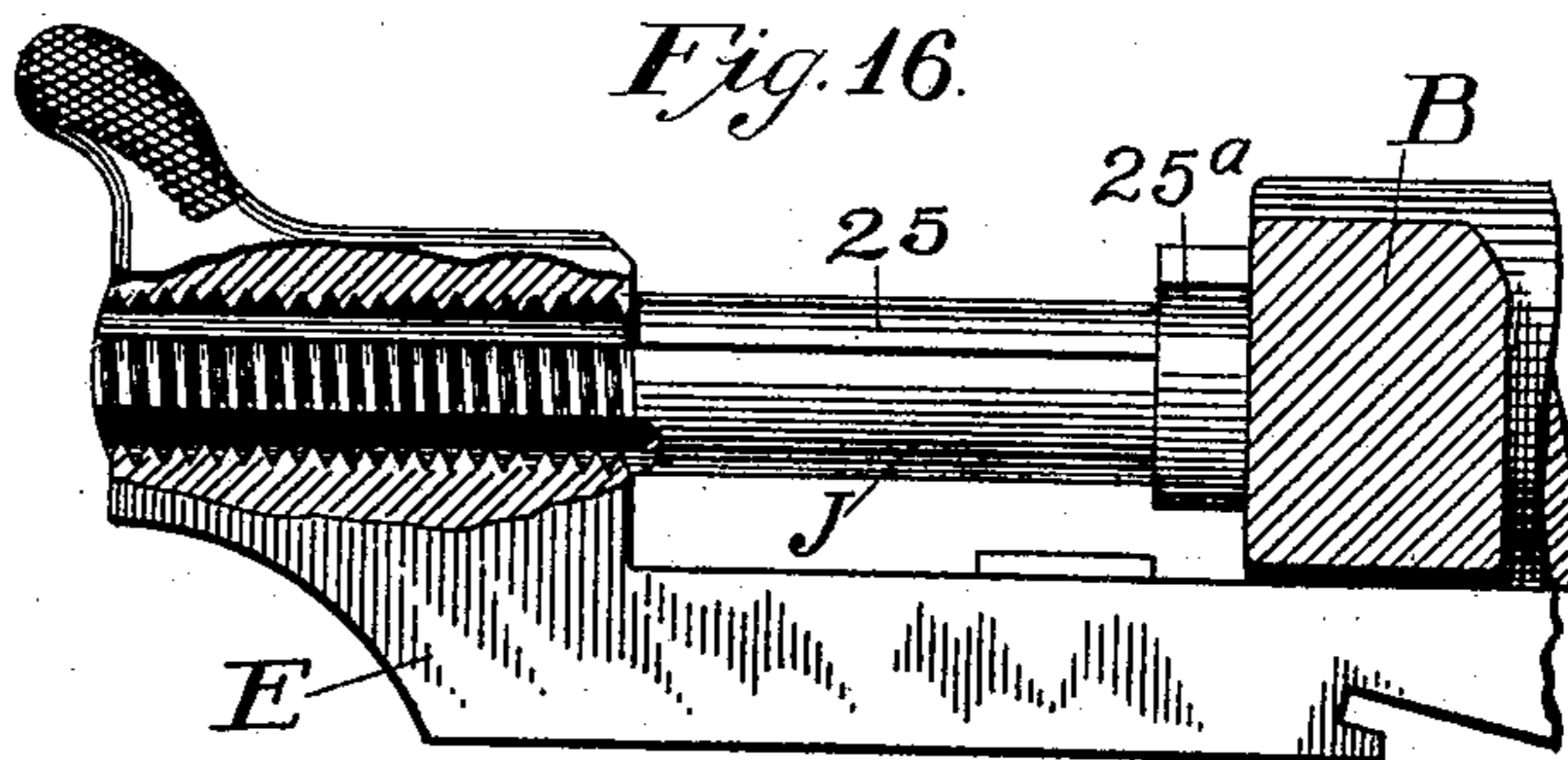
*Fig. 13.*



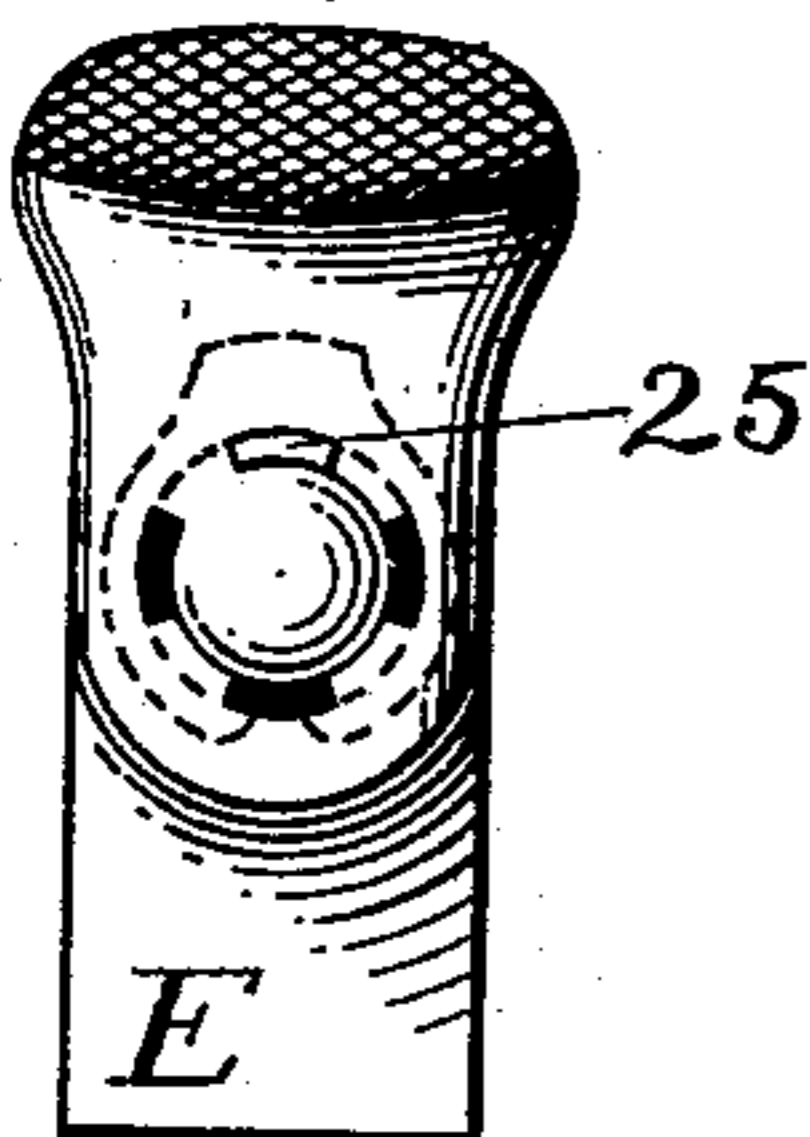
*Fig. 17.*



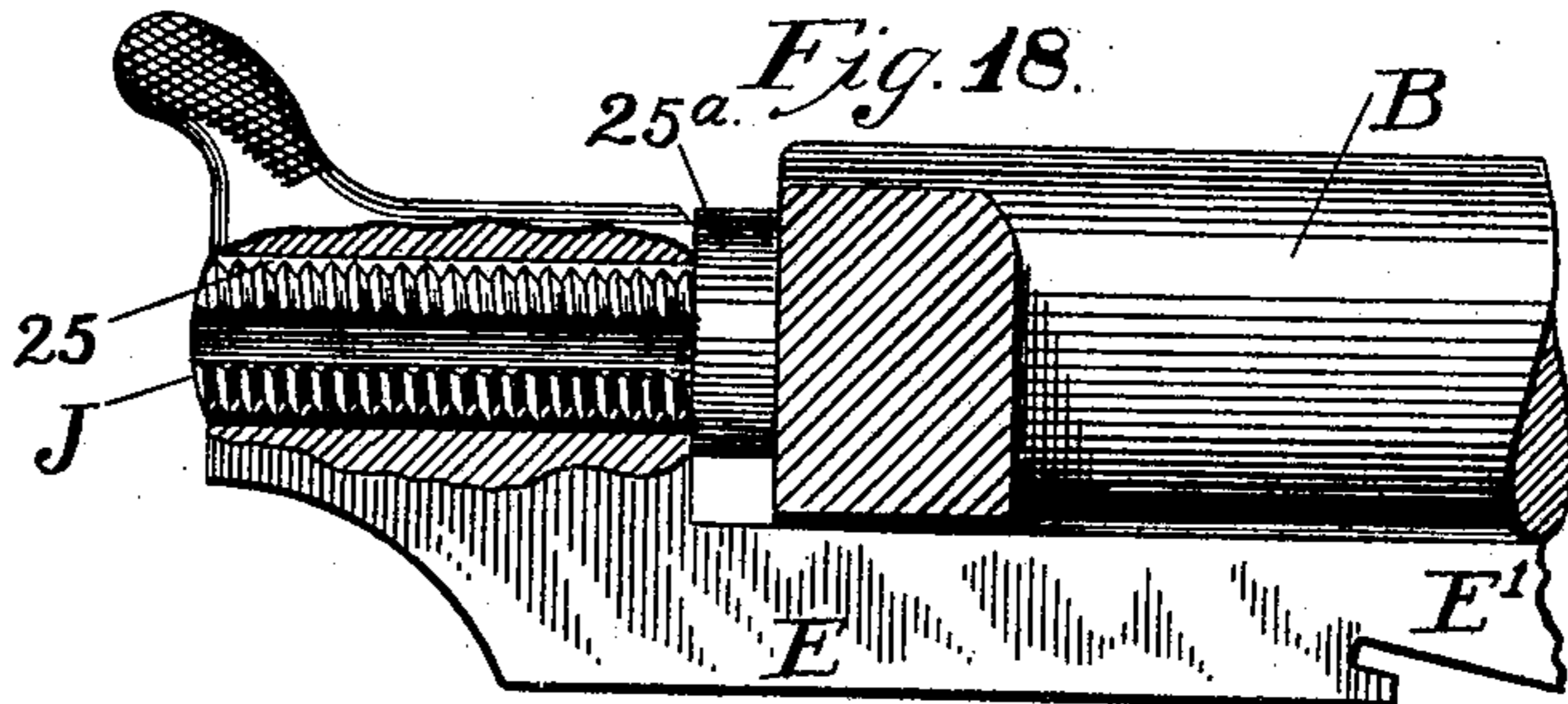
*Fig. 16.*



*Fig. 19.*



*Fig. 18.*



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(No Model.)

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MAGAZINE BOLT GUN.

7 Sheets—Sheet 7.

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Patented May 31, 1898.

Fig. 20.

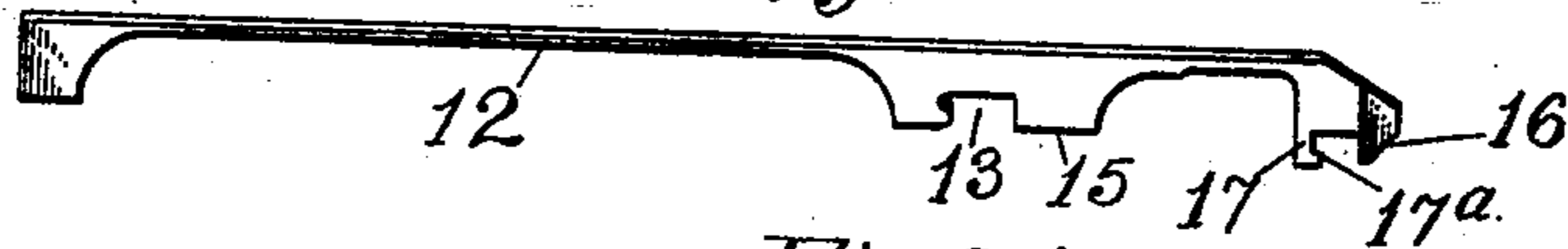


Fig. 21.

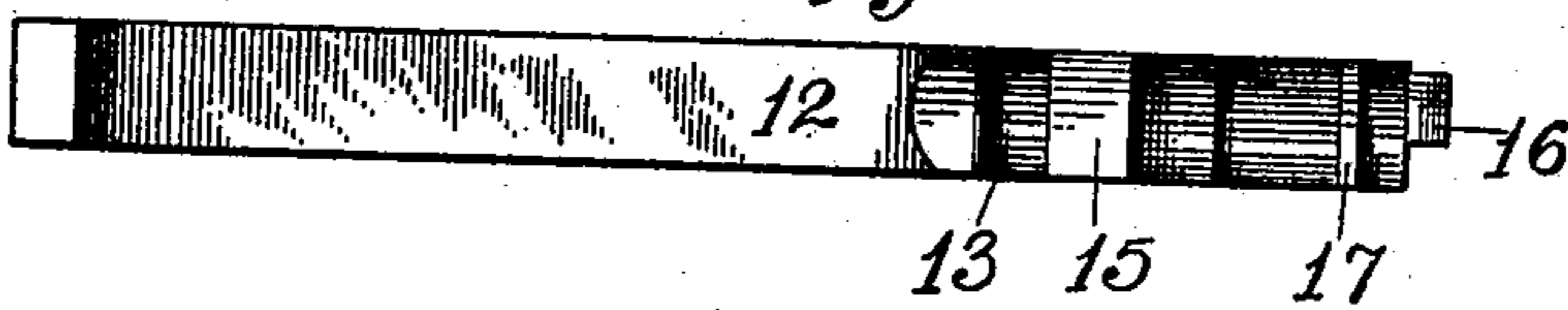


Fig. 22.

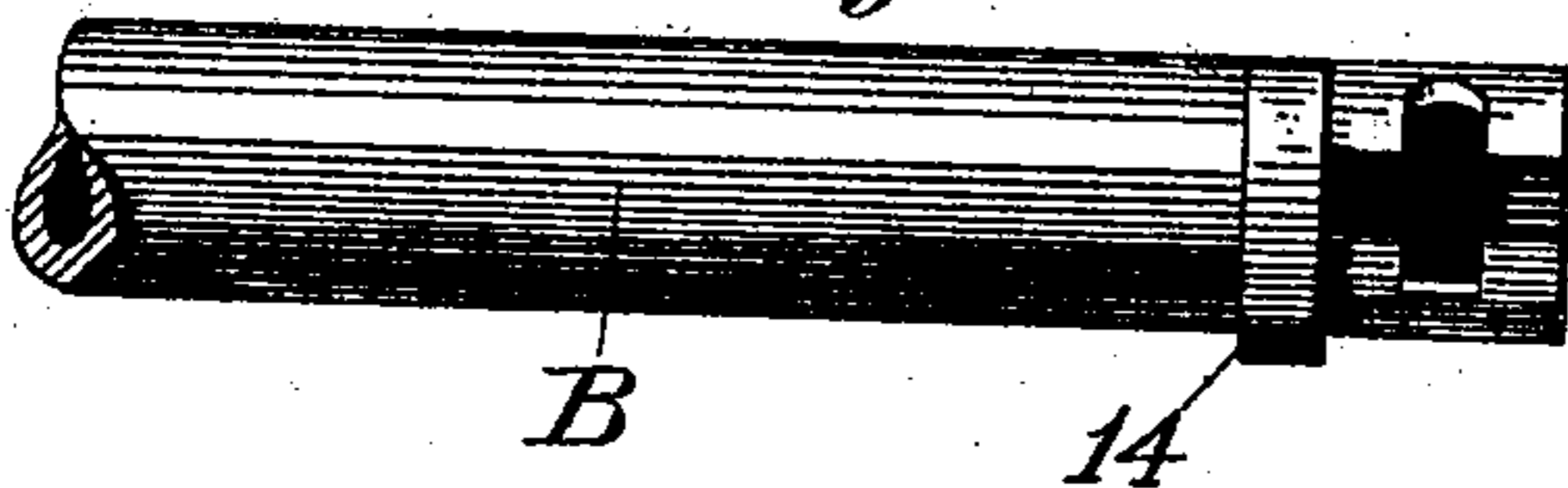


Fig. 24. Fig. 25. Fig. 23.

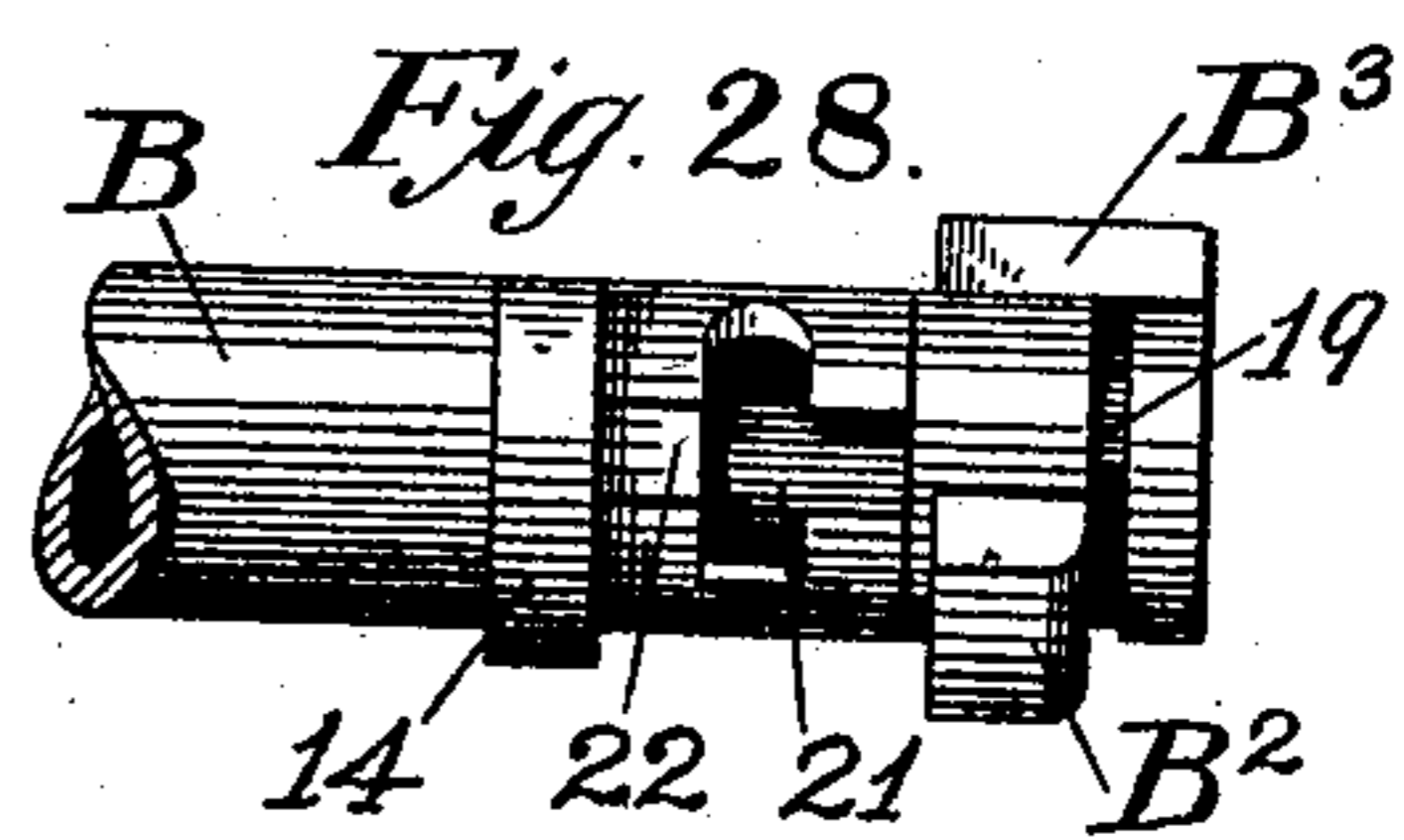
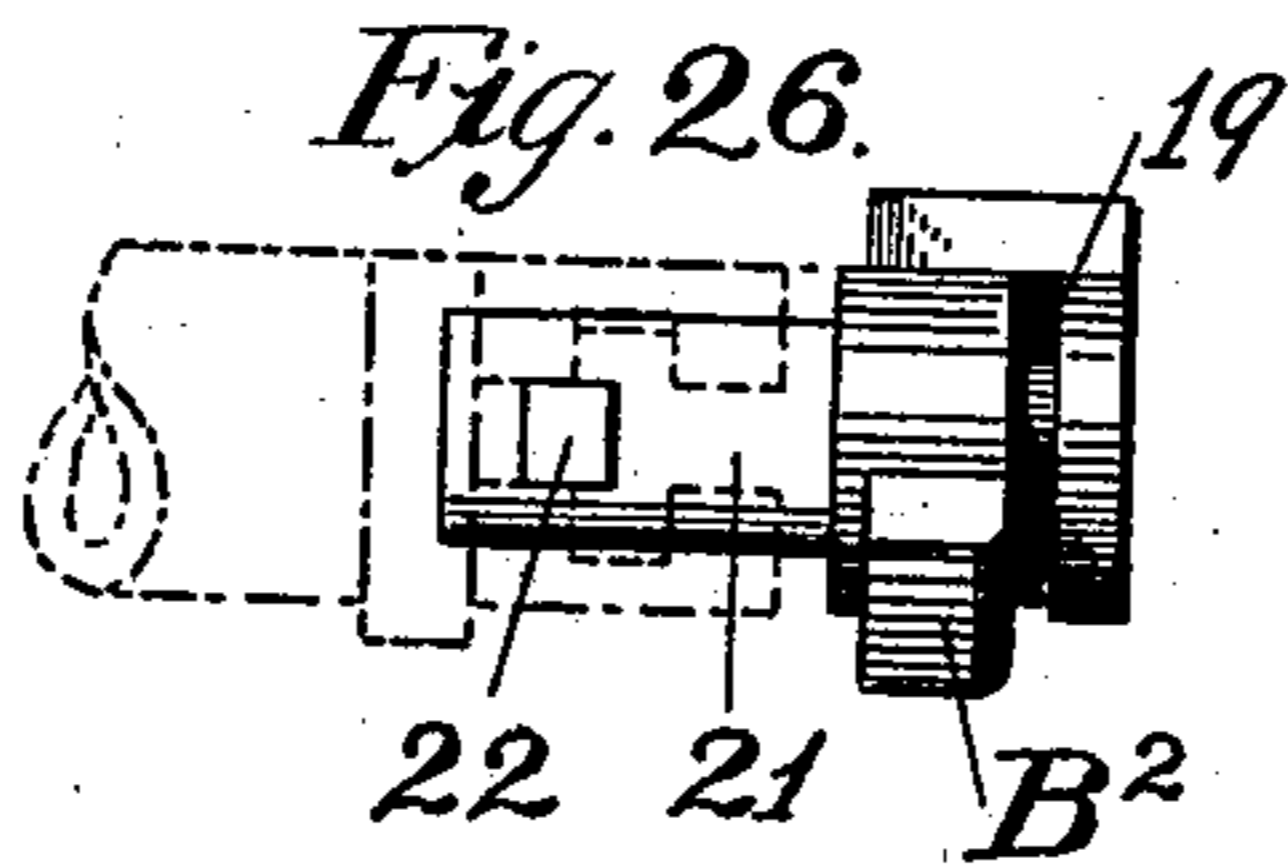
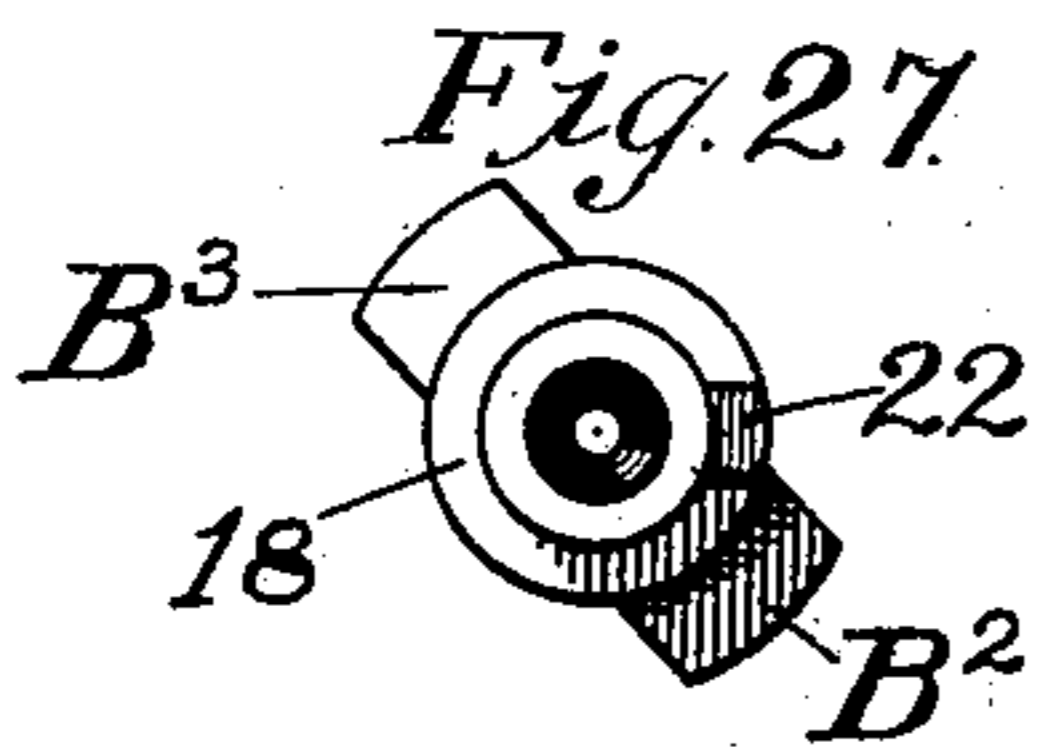
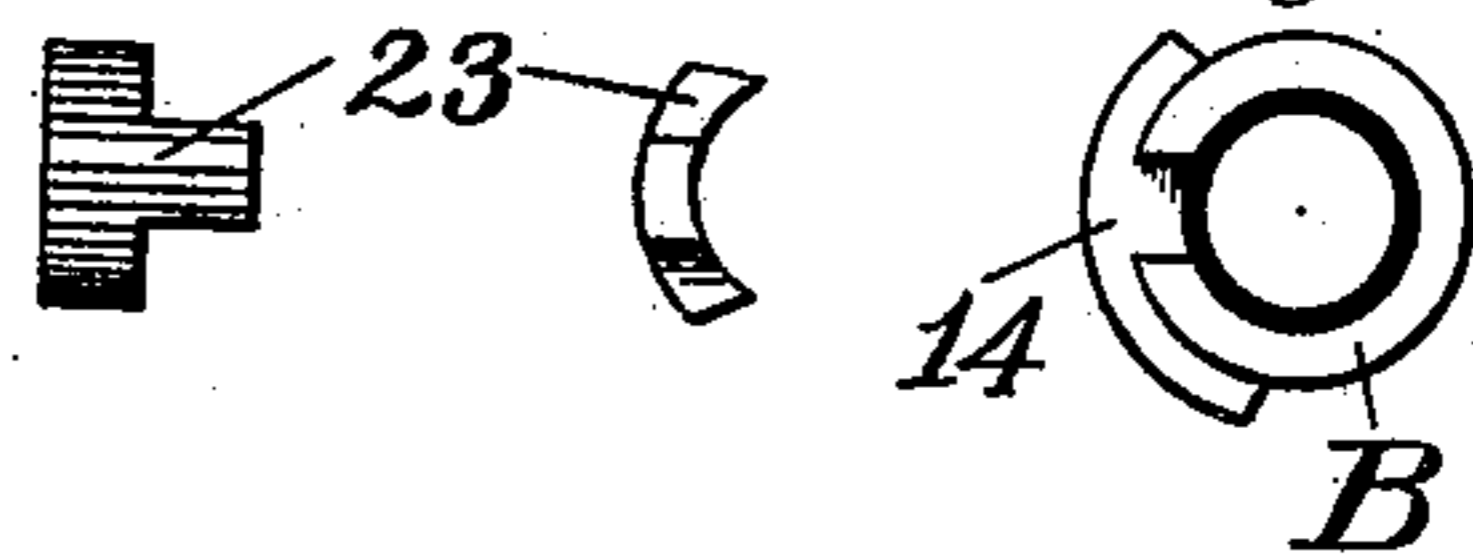


Fig. 29.

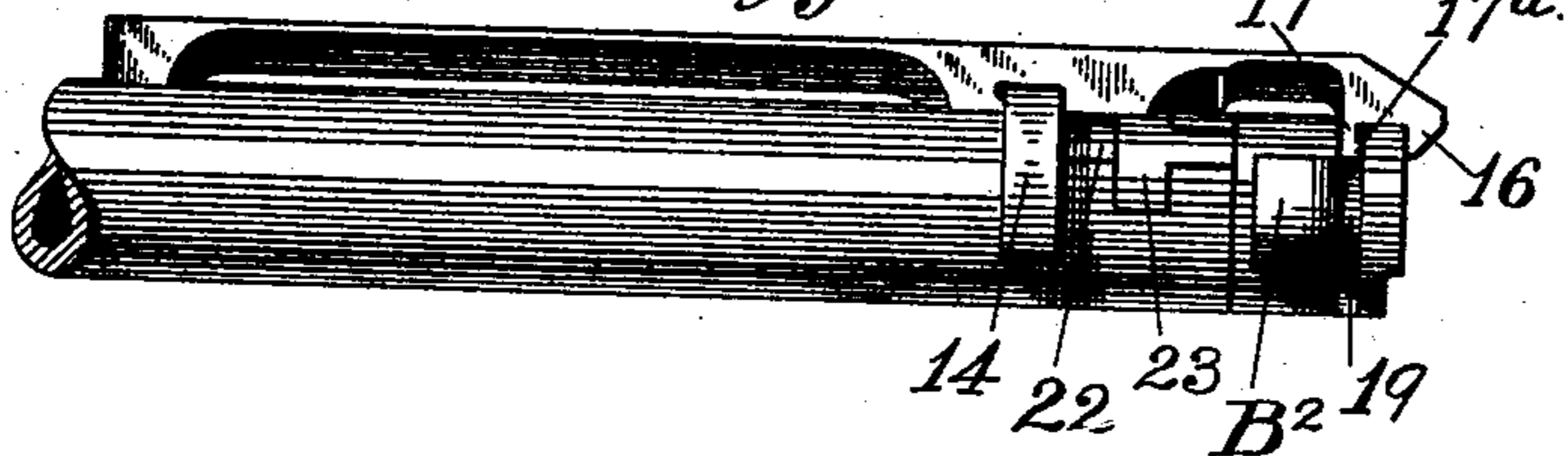


Fig. 30.

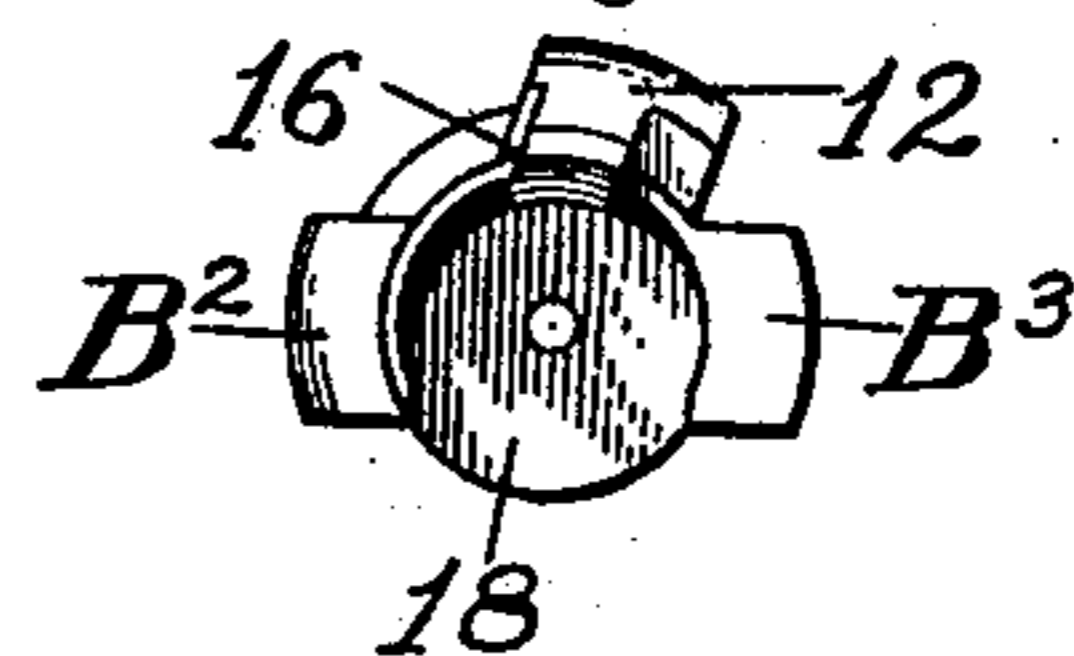


Fig. 31.

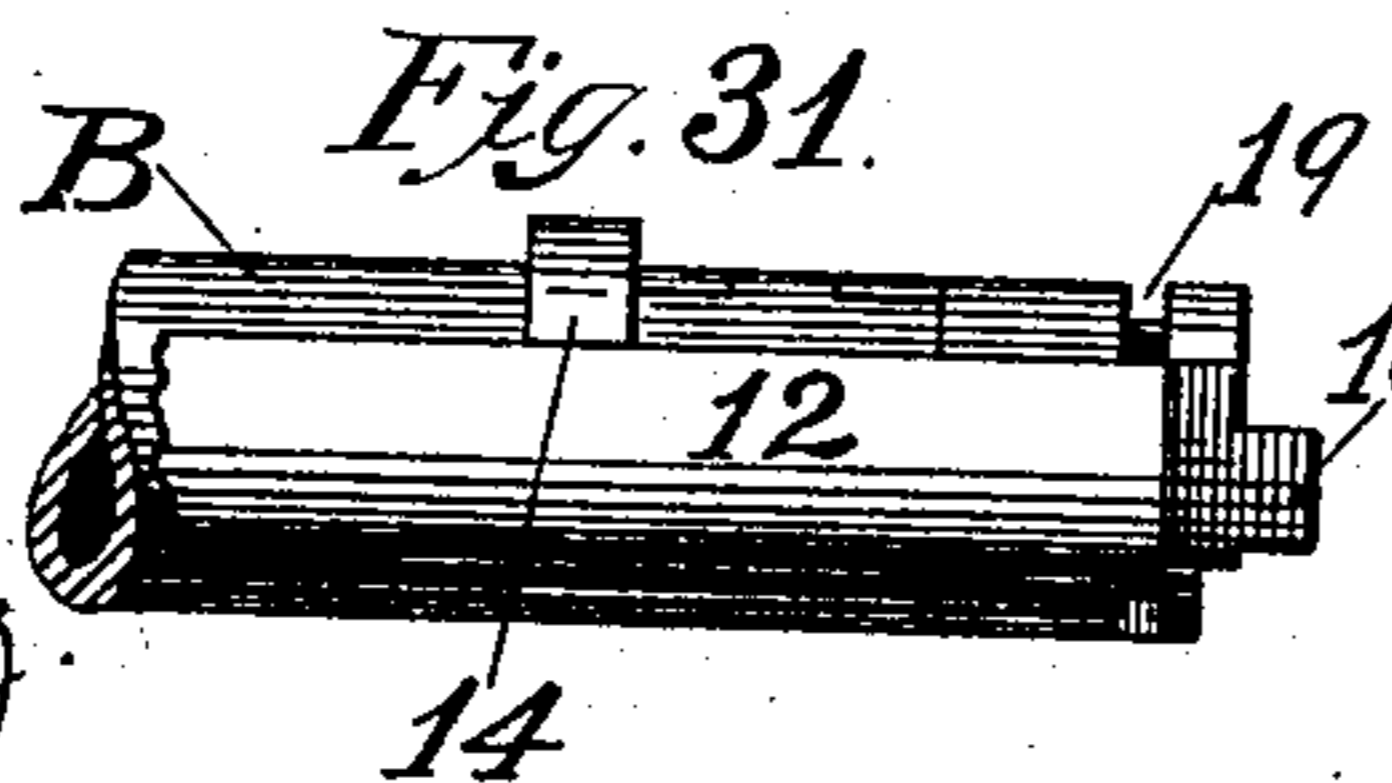


Fig. 32.



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# UNITED STATES PATENT OFFICE.

EDWARD G. PARKHURST, OF HARTFORD, CONNECTICUT, ASSIGNOR TO THE  
LEE ARMS COMPANY, OF CONNECTICUT.

## MAGAZINE BOLT-GUN.

SPECIFICATION forming part of Letters Patent No. 604,904, dated May 31, 1898.

Application filed April 20, 1896. Serial No. 588,365. (No model.) Patented in England May 5, 1896, No. 9,570; in France May 9, 1896, No. 256,228; in Belgium May 9, 1896, No. 121,276; in Italy May 9, 1896, LXXXI, 279, and in Austria July 28, 1896, No. 46/3,018.

*To all whom it may concern:*

Be it known that I, EDWARD G. PARKHURST, a citizen of the United States, residing at Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Magazine Bolt-Guns, of which the following is a full, clear, and exact specification.

This invention relates to firearms, its general object being to provide certain improvements whereby these weapons may be rendered more durable and efficient in service and whereby their constructive features are simplified and improved, reducing the cost of manufacture and facilitating the assembling and disassembling of the parts.

This invention is patented in Great Britain, No. 9,570, dated May 5, 1896; in France, No. 256,228, dated May 9, 1896; in Belgium, No. 121,276, dated May 9, 1896; in Austria, No. 46/3,018, dated July 28, 1896, and in Italy, LXXXI, 279, dated May 9, 1896.

While many or all of these improvements are applicable to other classes of firearms, they are more particularly designed for and are herein shown and described as applied to that class comprising what are known as "turn-bolt guns," in which the breech of the gun is opened and closed by means of a longitudinally-moving bolt which is locked in its closed or firing position by a partial turn upon its axis imparted to it by the hand of the operator. These guns are usually provided, as herein shown, with a magazine holding a supply of cartridges, the uppermost one of which is pushed into the barrel by the forward movement of the bolt and is fired while the bolt is in its closed position, the emptied shell being extracted and ejected during the opening movement of the bolt.

The specific objects of the invention may be categorically set forth as follows: first, to provide improved means for guiding and retaining the cartridge packet or filler in suitable position with relation to the magazine of the gun, so that the cartridges contained in the filler may readily be transferred to the magazine and so that the emptied filler may be automatically ejected from its filling posi-

tion with ease and certainty by the first succeeding operation of the bolt; second, to provide means whereby the upper or contracted mouth of the magazine, which operates to prevent the cartridges from being pushed upward through the opening in the breech left by the withdrawal of the bolt, may readily be opened to permit the cartridges to be pushed from the filler into the magazine, and to enable it to be thus operated by the fingers of the same hand which is employed to push the cartridges out of the filler; third, to provide an improved stop whereby the uppermost cartridge contained in the magazine may, if desired, be held below its bolt-engaging position, this being necessary when it is desired to use the gun as a single-loader; fourth, to provide improved means whereby the extractor may be firmly engaged by the bolt when in position in the receiver and so that they may readily be assembled and disassembled without the employment of any additional part or parts whatsoever; fifth, to provide means whereby the hook of the extractor may be automatically locked to the head of the bolt during the withdrawal of the cartridge-shell, so as to provide for the positive extraction thereof, and so arranged that the extractor shall be automatically unlocked from the bolt when the latter is pushed forward, so as to enable the extractor-hook to pass freely over the cartridge-head; sixth, to provide means for quickly attaching the cocking-piece to the rear end of the firing-pin in a simple and effective manner, dispensing with the use of removable screws, nuts, or pins; seventh, to provide means whereby the firing-pin may be sustained against injury from explosions of gas through the primer of the cartridge, providing a shoulder against which it may abut, and thus preventing injury to the firing-pin or its spring, and, eighth, to provide improved means for attaching the head of the bolt to the bolt itself, whereby the head may be quickly and readily attached and detached without the use of screws, pins, or other delicate and easily-injured parts, and so arranged that when fixed in place it shall be practically integral with the bolt itself.

Figure 1, Sheet 1, of the drawings is a right-hand side view of a firearm of the general type referred to, showing its external appearance as affected by the application of my improvements thereto. In connection therewith is also shown in dot-and-dash lines the outline of an emptied filler in the position it would occupy when just detached from the receiver and ready to fall. Fig. 2, Sheet 2, is a plan view of what is shown in Fig. 1. Fig. 3, Sheet 2, is a plan view in section, taken through the center line of the bolt and the barrel, showing a cartridge in position, with the firing-pin down upon it in the act of exploding the primer. Fig. 3<sup>a</sup>, Sheet 3, is a similar view of a portion only of the bolt and the firing-pin, showing the latter in the position against its sustaining-shoulder to which it would be forced by an explosion of gas through the primer. Fig. 4, Sheet 3, is a side view, partly in section, showing in their closed position the devices by means of which the normally-contracted upper portion of the magazine may be opened to allow the cartridges to be transferred from the filler. Fig. 5, Sheet 3, is a plan view of what is shown in Fig. 4 in section, taken through the center line of the barrel and through the forward portion of the bolt, the rearward portion thereof being broken away to enable the magazine-closer to be seen in its closed position, whereby the uppermost cartridge is prevented from being pushed up through the breech-opening by the action of the cartridge-elevator. Fig. 6, Sheet 4, is a side view, partly in section, the stock and the receiver being broken away sufficiently to show the position and relation of the magazine-closer in its open position, showing also a packet of cartridges with their filler in position sustained by the clip-engaging lug of the receiver in readiness for the operation of pushing the cartridges into the opened magazine. Fig. 7, Sheet 4, is a plan view of what is shown in Fig. 6, showing in comparison with Fig. 5 the relative positions of the wedge-shaped lock 6, which controls the position of the magazine-closer. Fig. 8, Sheet 5, is a left-hand side view of the gun of Fig. 1, with a portion of the stock broken away, so as to show the external appearance of the magazine-stop. Fig. 8<sup>a</sup> is a bottom view in section, taken on the line 8 8 of Fig. 8, showing the way in which the cut-off key is fitted to slide in the magazine-wall. Figs. 9 and 10, Sheet 5, are rear views in section, taken substantially along the line 9 10 of Fig. 6, the bolt being omitted. Fig. 9 represents the magazine-stop in its open or inoperative position and shows the magazine-closer in its open position corresponding to that shown in Fig. 6 to permit the entrance of the cartridges from the filler, while Fig. 10 shows the magazine-closer in its closed position, corresponding to that shown in Fig. 7, and in this view the magazine-stop is represented in its operative position, holding the uppermost cartridge below the path of movement of

the bolt. Fig. 10<sup>a</sup> is a plan view in section, taken on the line 10<sup>a</sup> of Fig. 10, showing the recess made in the key for the spring and its support. Figs. 11 to 19, inclusive, on Sheet 6, are enlarged detail views of my improved means for attaching the cocking-piece to the firing-pin. Fig. 11 is an end view, and Fig. 12 a side view, of the key employed to lock the cocking-piece in engaging relation to the firing-pin. Fig. 13 is a side view, and Fig. 14 an end view, showing the rear end of the firing-pin threaded and grooved to receive the cocking-piece, while Fig. 15 is an end view showing the cocking-piece also threaded and grooved, so as to adapt it to be pushed onto the firing-pin shown in Figs. 13 and 14. Fig. 16 is a side view, and Fig. 17 an end view, showing the cocking-piece and firing-pin assembled, with the locking-key in position ready to be pushed through its coinciding grooves in the pin and in the cocking-piece. Fig. 18 is a side view, and Fig. 19 an end view, showing the parts in their assembled and locked condition, and showing also the bolt in its closed relation to the cocking-piece and the key. Fig. 20, Sheet 7, is an edge view of my preferred form of extractor, and Fig. 21 is a view thereof looking at the adjacent side of Fig. 20. The side herein shown is that which faces toward the bolt and firing-pin of the gun when in operative position thereon. Fig. 22 is a side view, and Fig. 23 a front view, of a bolt prepared in accordance with my improved system to receive the bolt-head. Fig. 24 is a side view, and Fig. 25 an end view, of the locking-piece employed by me to fasten the bolt-head in place. Fig. 26 is a side view, and Fig. 27 a rear end view, of a bolt-head adapted in accordance with this invention to be attached to the bolt of Figs. 22 and 23, the dot-and-dash outlines of which are represented in Fig. 26 in a relation occupied by these parts when assembling them. Fig. 28 is a side view of the bolt and its head fully assembled, but without the locking-piece, the T-shaped recess for which is clearly shown therein. Figs. 29 and 30 are a side view and an end view, respectively, of the fully-assembled bolt with the extractor applied thereto at its assembling position. Fig. 31 is a side view, and Fig. 32 an end view, of the bolt and its head in the position occupied by them in Figs. 29 and 30, with the extractor moved around to the relative position occupied by it when the bolt is drawn to its rearward position in the receiver. Fig. 33, Sheet 4, is a fragmentary view of a portion of the breech mechanism, showing an emptied filler thereon swung back upon its supporting-lug, as upon a hinge, by the forward movement of the bolt toward its releasing position shown in Fig. 1. Fig. 34 of Sheet 1 is a similar fragmentary view of the parts, showing a modified position of the filler-sustaining lug below the general contour of the surrounding parts.

The terms "forward," "rearward," "right" and "left," "up" and "down" are herein em-

ployed to designate those directions as they would appear to an operator holding the gun in firing position at his shoulder.

As above stated, my improvements are herein shown to be embodied in a firearm having the general characteristics of guns of the class in which the bolt (designated in a general way by B) is mounted in the receiver C and is fitted to slide longitudinally therein. The bolt is provided with a lever D, by means of which its movements are controlled by the operator. This bolt (shown in its forward or closed position in Figs. 1, 2, and 3) is capable of backward movement to an extent sufficient to allow the heads of the cartridges contained in the magazine to be pressed up one after the other into the path of the forward end of the bolt, by means of which the cartridge is pushed along by the closing movement of the bolt toward and into the chamber of the barrel. The bolt herein shown is of the "forward-locking" type, being provided with engaging lugs B<sup>2</sup> B<sup>3</sup> at its forward end, which engage with suitable corresponding shoulders made in the forward end of the receiver, the engaging and locking movement being accomplished by substantially a quarter-turn movement of the lever D of the bolt from the vertical position shown in Fig. 4, which represents the opening position of the bolt, to that shown in Figs. 1, 2, and 3, which represent the bolt in its locked or firing position, which movement releases the locking-lugs B<sup>2</sup> B<sup>3</sup> from their engagement with the corresponding shoulders in the receiver and allows the bolt to be drawn longitudinally to its opened position.

In the operation of moving the lever D from the position shown in Figs. 1 and 2 to that of Fig. 4 a portion thereof engages with the beveled shoulder C' of the receiver, which operates as a cam to force the bolt rearwardly to the extent shown in Figs. 4 and 5, and thus serves as a powerful device for slowly starting the cartridge-shell from its seat in the chamber of the gun.

The firearm is provided with a magazine M, located below the breech-opening and adapted to hold the cartridges one above the other, as shown in Fig. 10. These cartridges are pressed upwardly by means of a leaf-spring, as shown in Fig. 9, or they may be so pressed by means of any of several well-known devices for this purpose. The upper portion of the cartridge-containing space of the magazine is preferably contracted by means of the side walls, so as to prevent the cartridges from being pushed directly upward and so as to allow the rim of the uppermost cartridge to project into the path of the bolt of the gun, by means of which the cartridge is pushed forward until its forward end has entered the chamber of the barrel a sufficient extent to guide the cartridge, at which point the walls of the magazine are widened sufficiently to release the head of the cartridge and allow it to rise up into alignment with the bore of the gun.

The rearward end of the firing-pin J has at-

tached to it a cocking-piece E, which is guided in a longitudinal groove in the adjacent portion of the receiver. Its forward end E' is adapted to engage with the sear F', which is pivoted in the receiver and is pressed toward the cocking-piece by means of the spring F', a portion of the sear being in engaging relation to the trigger G.

A bolt-stop I, attached to the receiver, forms a stop for the backward position of the bolt at a point which allows the uppermost cartridge contained in the magazine to be pushed in front of the forward end of the bolt.

Having thus described the general features of the gun in connection with which my improvements are herein shown, I will now proceed to a description of the improvements themselves.

*The filler and its attaching device.*—The numeral 1 represents my improved filler, (best shown in Figs. 6, 7, 9, and 10,) the use of which is to hold together a packet of the cartridges preparatory to inserting them in the magazine of the gun. This filler is provided with clasps 2, which are preferably made integral with the filler by slitting the sheet metal of which the filler is preferably made and bending the clasp portions 2 outward therefrom to the form shown in Fig. 6. These clasps are located at the same distance from their respective ends of the filler, so that the latter may be applied to the receiver either end uppermost and be in each case so held that the lower cartridge shall rest in proper relation to the mouth of the magazine. A retaining-lug 3, preferably integral with the receiver, is so located thereon as to engage with the clasps and sustain the filler in a position suitably related to the magazine, the clasp engaging behind the lug, so as to sustain the weight of the overhanging cartridges against their tendency to pull the filler forward into the breech-opening.

In a contemporaneously-pending application, Serial No. 624,538, filed February 23, 1897, I have shown, described, and claimed an improved filler which as to its means for attachment upon the firearm is similar to the filler 1 shown in Figs. 1, 6, and 33. That filler is therefore herein shown and described only to an extent sufficient to enable its conjoint use with this firearm to be clearly understood.

The lug 3 is preferably made with a recessed or reduced neck below its upper or head portion, so as to enable the end of the filler-clasp to be sprung over the head and to spring into the recessed or neck portion of the lug, thereby retaining the filler in position with a greater degree of certainty to prevent accidental or inadvertent dislodgment during its manipulation. That portion of the receiver in front of the lug 3 is recessed, as best shown in Fig. 2, leaving shoulders 4, adapted to guide the sides of the filler as it is inserted in the receiver and adapted to support it against sidewise displacement during the op-

eration of transferring the cartridges therefrom into the magazine. Unless the fillers are to be saved for subsequent use no attention is paid by the operator to the emptied filler, it being automatically dislodged from its position by the forward movement of the bolt, as shown in Figs. 1 and 33, in the regular operation of loading and firing of the gun.

*The magazine-closer.*—This is best shown in Figs. 4, 5, 6, 7, 9, and 10. The two latter figures represent a section taken through the magazine, showing the closer in its open and in its closed positions, respectively. Normally and especially during the firing operations of the gun the closer remains in the closed position shown in Fig. 10, so that the uppermost cartridge therein shown, if released from the engagement of the cut-off, the construction and purpose of which will be hereinafter explained, would be carried by the elevating means against the upper portion of the magazine, the contracted side walls of which prevent the cartridge from being pushed vertically out of the magazine; but they enable its rim or head to project into the path of the bolt to a sufficient extent to enable that bolt upon its forward stroke to engage with the upper portion of the rim of the cartridge and push it forward to a portion of the magazine at which the side walls permit the upward escape of the cartridge on its way into the chamber of the barrel in the well-known way. Inasmuch as the contracted walls shown in Fig. 10 operate to prevent the cartridges from passing upwardly between them, it follows that they would also operate to prevent the ingress of cartridges from the filler unless means are provided for temporarily opening one or both of the contracted walls of the magazine.

According to this invention, as herein shown, the magazine-closer 5 is hinged at its forward end to swing laterally, as shown in Figs. 4, 6, and 7, to the right-hand side wall of the magazine or to any suitable adjacent portion of the gun. During the normal operation of the gun the closer is in its closed position, (shown in Figs. 4, 5, and 10,) resting in line with and forming a continuation of the adjacent side wall of the magazine, its upper portion extending into and contracting the magazine-space for the purpose above mentioned. It is locked in this position by means of the closer-lock 6, which is fitted to pass between the closer and the adjacent side of the receiver or other convenient adjacent fixed portion of the gun. The inner face of this lock is inclined and engages with a similarly-inclined portion 5<sup>a</sup> of the outer face of the closer, so that the former when moved to the position shown in Figs. 4 and 5 operates to move the closer to the closed position and to sustain it in that position.

In order to enable the closer to be opened to the position shown in Figs. 7 and 9, the lock 6 is moved aside to the position shown in Figs. 6 and 7. As a convenient means of

thus moving the lock I have shown it pivotally mounted upon the right-hand side wall of the magazine and provided with an extension 6<sup>a</sup>, which is engaged and operated by the key 7. The upper end of that key is fitted to slide vertically through a suitable guide in the frame or receiver of the gun, and its lower end extends through and below the stock of the gun to a position where it may readily be engaged by the finger of the operator. The key is pressed toward its lower position (shown in Figs. 1, 4, and 10) by means of the spring 8, located in a recess of the key, as shown in Fig. 10<sup>a</sup>, the upper portion of the spring abutting against the projection 8<sup>a</sup> of the side wall of the magazine M, and that spring operates to hold the closer in its closed position by means of its connection with the lock 6. The key is fitted to slide in the stock of the gun, or it may be fitted to the side wall of the magazine, like the key 10, as shown in Fig. 8<sup>a</sup>. This arrangement for releasing the closer enables the cartridges to be transferred from the filler into the magazine of the gun by the use of a single hand of the operator. After having placed the packet of cartridges in position, as shown in Fig. 6, he places his thumb upon the topmost cartridge and a finger beneath the lower end of the key 7. Then by bringing the finger and thumb toward each other the cartridges are forced down against the closer by the thumb and the closer-lock 6 is opened by the finger, the pressure upon the uppermost cartridge and upon the end of the key thus reacting through the hand of the operator. The unlocked closer is thus free to be pushed open by the file of cartridges, all of which under the continued pressure of the thumb pass out of the filler into the magazine. As soon as the last cartridge is pushed into the magazine and the contracting action of the finger and thumb is released the spring 8 operates to shut the closer to the position shown in Figs. 5 and 10.

The rearward end of the closer is provided with an L-shaped lateral extension 5<sup>b</sup>, (best shown in Figs. 4 and 5,) which is fitted to slide in a corresponding groove in the adjacent portion of the receiver. The object of this extension is to support the closer against the upward pressure of the cartridges in the magazine and to prevent the twisting of the closer when it is released from the support of the lock 6. This extension or guide of the closer thus prevents undue strains being thrown upon the hinge, which may therefore be made short, as herein shown.

*The magazine cut-off.*—This is best shown in Figs. 8, 9, and 10, being herein represented upon the left-hand side of the gun, which, as hereinafter explained, is in itself not a material circumstance, inasmuch as it may with equal effectiveness be placed upon the right-hand side. As herein shown, it consists of the cut-off 9, pivotally mounted upon the lugs of the wall of the magazine, and of the operating-key 10, fitted to slide in a

corresponding slot in the wall of the magazine, the amount of longitudinal movement of the key being shown by a comparison of Figs. 9 and 10. The key is provided with thin flanges which fit against the inside wall of the magazine, and thus serve to retain the key thereon, as shown in Fig. 10<sup>a</sup>. The lower end of the key is adapted to be seized by the finger or thumb of the operator, and its upper end is beveled to engage with the adjacent end of the cut-off 9. The latter is provided with a spring 11, which is preferably attached to the side wall of the magazine and passes behind the upper portion of the cut-off, the tension of the spring being in a direction to hold it toward the position shown in Fig. 9, or into contact with its key. The curved upper end of the cut-off 9 when the parts are in the position shown in Fig. 10 extends through a slot in the wall of the magazine, so as to engage with the uppermost cartridge, being carried to this position by pushing the key 10 to its uppermost position, where it is retained by means of the lower end of the cut-off 9 engaging in a corresponding cross-groove in the key 10. Before pushing this key upward to the position shown in Fig. 10 the uppermost cartridge is pressed down by the finger or thumb of the operator, so as to allow the cut-off to enter above that cartridge, as shown in the latter figure. In this position the uppermost cartridge rests below the path of travel of the bolt, so that the latter may be moved backward and forward without feeding any cartridges from the magazine, thereby enabling the firearm to be used as a single-loader.

It will be obvious that the inclined surface or the rounded recess, or both, which are herein shown to be upon the key 10, may instead be made upon the lower end of the cut-off 9, and I would regard such a construction as an equivalent of that herein shown, although, in my opinion, the construction herein shown would be preferable to the other, inasmuch as the portion of the cut-off 9 to which the inclined surface of the key is applied remains at a constant distance from the pivot of the cut-off.

*The extractor-engaging means.*—The extractor 12 (shown in detail in Figs. 20 and 21) is provided with a recess 13, dovetailed or undercut on the rearward side thereof, and the bolt B is provided with a correspondingly-shaped annular rib 14, (shown in section in Figs. 3, 3<sup>a</sup>, and 5,) which extends part way around the circumference of the bolt, as shown in Figs. 28 to 32, inclusive, being cut away sufficiently to allow the extractor to be attached at the position shown in Fig. 30, from which it is turned circumferentially upon the bolt to the position shown in Fig. 32. This form of engagement of the extractor with the bolt allows of the turning movement of the latter necessary to unlock its forward end from its closed position in the receiver, the extractor remaining in its longitudinal groove, which is herein shown to be upon the right-hand side

of the bolt, and it therefore partakes only of the longitudinal movement of the latter. That turning movement of the bolt in the receiver is herein shown to be limited to substantially ninety degrees from the position shown in Fig. 32, so that in the operation of the gun the bolt cannot be turned far enough to bring the extractor to its disengaging position, as shown in Fig. 30. It is necessary to remove the bolt from the receiver before the extractor can be moved to its disengaging position, as shown in the latter figure.

The recess 13 of the extractor is made wider than the thickness of the rib 14 to an extent sufficient to allow of the longitudinal locking movement of the extractor with relation to the bolt, as hereinafter set forth, and also to allow the head of the extractor to spring away from the bolt when in the unlocked position, to which it is moved by the impinging of the rim of the cartridge against the forward side of the hook in the operation of pushing the cartridge into its chamber in the barrel.

The extractor is made of a suitable length and is reduced in thickness where permissible, so as to have it sufficiently elastic. Adjacent to the recess 13 is the surface 15, adapted to retain the locking-piece 23 in position, as will be hereinafter described.

*The extractor-locking device.*—At its forward end the extractor is provided with a hook 16, adapted to pass over the head of the cartridge, the barrel-chamber being recessed sufficiently to permit of its entrance. At a point immediately adjacent to the hook the extractor is provided with a locking-rib 17, having a locking-shoulder 17<sup>a</sup>, and the bolt-head 18 is provided with a corresponding groove 19, (best shown in Figs. 3 and 5,) the bottom portion of the groove being recessed or extended toward the front of the bolt, so as to provide for suitable locking engagement with the locking-shoulder 17<sup>a</sup>, as shown in Fig. 5. The extractor is fitted upon the bolt so as to allow of a longitudinal movement thereon, as best seen by a comparison of Figs. 3 and 5, being pushed to the unlocked position shown in the latter figure by the combined action of the forward movement of the bolt and the retarding action upon the extractor in passing over the head of the cartridge, the locking-shoulder 17<sup>a</sup> being then in a position to allow the head of the extractor to move away from the bolt to a sufficient extent for this purpose. After the gun is fired and as the bolt is drawn backward to open the breech the rim of the cartridge impinges against the rearward side of the hook 16, and because of its resistance to extraction draws the extractor to the position relative to the bolt shown in Fig. 5. The greater the resistance of the cartridge-shell to the extracting operation the more thoroughly do the locking-shoulders of the extractor and of the bolt-head engage, so that the hook cannot be sprung away from the bolt and be drawn over the rim of the cartridge. Thus the front end

of the extractor is automatically locked to and unlocked from the bolt-head at the desired positions by the regular operation of the gun.

*Means for protecting the mechanism against explosions of gas through the cartridge-head.*—The bolt B is bored throughout its length, as shown in Fig. 3, to receive the firing-pin J and is counterbored to receive the mainspring K. It is also counterbored to a still larger size at its forward end to receive the enlarged collar 20 of the firing-pin, that collar being utilized as an engaging means for the forward end of the spring and being also adapted to limit the forward and backward movement of the pin with relation to the bolt. The forward side of the collar 20 is stopped against the rearward end of the bolt-head 18, and the rearward side of the collar is fitted to abut against the shoulder 20<sup>a</sup>, which forms the bottom of the counterbore for the collar. The extent of permitted longitudinal movement of the collar between its limiting-shoulder is slightly greater than the extent to which the collar is drawn backward in the normal operation of the firing-pin, that extent being well within the allowable limit of compression of the spring K. In the case of an explosion of gas through a defective primer sufficiently great to force the firing-pin back against the pressure of the mainspring the collar 20 collides with the shoulder 20<sup>a</sup> at the bottom of its counterbore, as shown in Fig. 3<sup>a</sup>, thus preventing injury to the firing-pin or to its spring as the result of such an explosion. The closing of the collar 20 against the shoulder 20<sup>a</sup> also serves to prevent further escape of the gas, so that the remainder of its expansive force is exerted upon the projectile instead of being lost or wasted.

*Means for attaching the bolt-head.*—For greater convenience in assembling and disassembling of parts the bolt is made separable at its forward end by means of the removable bolt-head 18. That head is provided with a stem 21, which is fitted to the bore in the forward end of the bolt, and this stem is provided with an abutment 22, which preferably extends into a recess preferably in the form of a Latin cross cut in the shell of the bolt, as shown in Figs. 22 and 23, its outward surface coinciding with the cylindrical portion of the bolt, as shown in Figs. 27, 28, and 29. The abutment 22 fills the rearward upper portion of the recess, leaving the remainder thereof of a T form after the insertion of the bolt-head, as shown in Fig. 28. Into this recess is fitted the corresponding T-shaped locking-piece 23, as shown in Figs. 24 and 25, which, as shown in the latter figure, is curved to conform to the cylindrical shell of the forward portion of the bolt, its inner portion resting upon the stem 21 of the bolt-head and its outer portion coinciding with the cylindrical surface of the bolt. The side wings of the lock engaging with the corresponding side wings of the recess of the bolt forms a positive lock to hold the abutment 22, and hence

the bolt-head 18, rigidly attached to the bolt. Inasmuch as there is no tendency to throw the lock 23 out of its recess it is only necessary to provide means for preventing it from falling out, and that means is found in the application of the extractor upon the bolt, as shown in Figs. 29 to 32, inclusive, the surface 15 of the extractor resting upon some portion of the lock 23 in all of the operative positions of the bolt.

It is not an essential feature that the recess in the bolt shall be of the exact form shown in Fig. 22, inasmuch as it is obvious that the form of that recess may be modified considerably. For example, it may be of the form of the locking-piece 23, (shown in Fig. 24,) in which case the lug 22 of the bolt-head would be turned sidewise into one of the lateral wings of the T, leaving an L-shaped recess to be filled by the locking-piece, which, as shown in Fig. 29, would underlie the extractor substantially as at present. With this form of recess the locking-piece would serve to prevent the initial turning movement of the bolt-head necessary to clear it from its longitudinally-detaining transverse shoulder of the bolt. I therefore desire to avoid limiting myself to the exact cross-shaped recess, although I prefer that form, believing it to be the most satisfactory.

The bolt-head 18 is provided with the locking-lugs B<sup>2</sup> and B<sup>3</sup>, by means of which the bolt B is secured in its forward or firing position with relation to the receiver C by means of a quarter-turn of the bolt, communicated to it by the lever D, as previously explained, the extractor passing over the lug B<sup>2</sup>, as shown in Figs. 31 and 32, when the bolt is turned to its unlocked or withdrawing position. The bolt-head is also provided with the groove 19, as previously explained in connection with the extractor-locking device.

*Means for attaching the cocking-piece to the firing-pin.*—The rear end of the firing-pin J is threaded and grooved, as shown in Figs. 13 and 14, and the cocking-piece is correspondingly threaded and grooved, as shown in Fig. 15, forming series of interrupted threads, the threaded portions of one being equal in width to the corresponding grooved portions of the other, so that the cocking-piece can be pushed longitudinally upon the firing-pin to the position shown in Fig. 16. One of the grooves, as 24, in the firing-pin is made longer than the rest, as shown in Fig. 13, to a sufficient extent to receive the key 25, which is provided with a split ring 25<sup>a</sup>, preferably integral therewith. The hole through the ring portion is of the same diameter as the firing-pin J; but it is contracted by bending, so as to bear with a suitable degree of friction upon the sides of that pin. This ring is slipped over the end of the pin, with its key 25 sliding in the groove 24 to the position shown in Fig. 16, and the cocking-piece is also pushed longitudinally to its position shown in that figure. By giving the firing-pin with its key

one-eighth of a turn with relation to the cock-

ing-piece their threaded portions are made to engage, bringing each groove in the firing-pin into coincidence with a corresponding groove in the cocking-piece. The key is then pushed through the groove, which is thus opened before it, to the position shown in Fig. 18, where it prevents any turning of the cocking-piece upon the firing-pin. When it is desired to disassemble the parts, the firing-pin is drawn back and the key 25 is pushed forward by means of its ring to the position shown in Fig. 16. Then by unscrewing the cocking-piece to the extent of one-eighth of a turn upon its axis it is free to be removed longitudinally.

In the organization of parts herein shown the magazine-closer is upon the right-hand side of the gun and the magazine cut-off is upon the left-hand side. It is obvious that these positions may be reversed or changed to suit the various required conditions of service.

In the principal figures of the accompanying drawings the lug 3 is shown projecting above the general contour of the receiver, being so arranged because in this position it may be more readily machined to shape; but that lug may, if desired, be located below the general level of the upper surface of the receiver, as shown in Fig. 34, a corresponding change being made in the location of the clasps upon the filler to adapt them to be used therewith.

It will be understood that the rib 14 and the groove 19 of the bolt are extended circumferentially part way around the bolt to allow of the turning movement of the latter relative to the extractor necessary to the locking and unlocking of this type of bolt to and from its receiver. During the forward or locking movement of the bolt the extractor is pushed back, so that its locking-shoulder 17<sup>a</sup> is unlocked from the recess of the groove 19, as shown in Fig. 3, so as to allow the extractor-hook to spring over the head of the cartridge when the latter reaches its seat in the chamber of the barrel or as soon as the resistance of the cartridge is sufficient to push back and spring outwardly the hook 16 of the extractor. During the backward or unlocking movement of the bolt the locking-shoulder 17<sup>a</sup> is drawn to the locked position shown in Fig. 5, and in this position the bolt continues its partial rotation, being forced gradually backward by means of the inclined shoulder C' engaging the lever D of the bolt. This device for locking the forward end of the extractor to the bolt is not limited in its application to turn-bolt guns, inasmuch as it may be quite as effectively applied to guns of other types in which the retracting or opening movement of the breech-block, in conjunction with the extracting resistance of the cartridge, may be utilized to lock the extractor-head in various modified ways within the scope of my present invention. When employed upon guns of other types, it is obvious that the extractor-engaging parts thereof,

which perform the functions of the rib 14

and the locking groove 19, must be adapted

to suit both the longitudinal and transverse movements of the bolt or breech-block relative to the extractor. In all cases it is desirable that the lock shall be located as closely as possible to the extractor-hook in order to hold it rigidly thereto when in locked position.

If the locking-rib 17 and its coengaging rib on the bolt-head are made sufficiently strong, it might be permissible to dispense with the rib 14 of the bolt and its recess 13 of the extractor. The employment of the latter, as herein shown, is, however, considered to be more safe and satisfactory, inasmuch as by its use a considerable portion or even all of the longitudinal strain due to the extraction of a jammed cartridge may be transferred through the rib 14 directly to the bolt instead of coming against the bolt-head. Such a strain would, moreover, draw the beveled rearward side of the recess 13 of the extractor against the corresponding surface of the rib 14, thus forcing that portion of the extractor firmly against the bolt and holding the locking-piece 23 securely in place. The rib 14 also assists materially in holding the parts of the breech-bolt together when it is removed from the gun.

I claim as my invention—

1. In a firearm, a receiver provided with a lug for receiving and temporarily retaining a detachable magazine-filler, the lug having an enlarged retaining-head for engaging with a clasping member of the filler.

2. In a firearm, in combination with the receiver thereof, a supporting-lug provided with a rounded head for temporarily engaging with the clip or clasp of a detachable magazine-filler so as to form a temporary supporting and retaining pivot upon which the emptied filler may be swung backward.

3. In a firearm, in combination with the receiver thereof, a supporting-lug, having an enlarged rounded head for engaging with a cartridge-filler, forming one member of a hinged connection therewith, the lug being recessed upon its rearward side below the rounded head portion to an extent sufficient to allow of a suitable backward inclination of the filler, beyond which the filler is detached by impinging against the lug.

4. In a firearm, a receiver having a filler-receiving recess in the rearward wall of the breech-opening thereof, the side walls of the recess sustaining the cartridge-filler against lateral movement relative to the breech, and the rearward wall being provided with a filler-sustaining lug for engaging with a suitable clasp upon the filler.

5. A magazine for firearms, having the upper portion of its side wall hinged at its forward end, whereby the rearward or cartridge-head end may be swung laterally outward, for the purpose specified.

6. A magazine-mouth closer for firearms, hinged at its forward end and provided with

a lateral guiding extension at its rearward end, for the purpose specified.

7. In a firearm of the class specified, the magazine thereof having the upper portion of one of its side walls cut away, and a closer for the opening thus made, hinged at its forward end, the upper portion of the closer extending into and contracting the upper portion of the magazine-space so as to prevent the passage of the cartridges, the rearward end of the closer being provided with a lateral guiding extension passing transversely through a supporting-slot in the receiver rearwardly of the cartridge-space.

8. In a firearms-magazine, having the upper portion of one of its side walls cut away, a closer for the opening thus made, pivotally mounted upon the side wall, and provided with an inclined cam portion upon its outward surface for forcing the closer to its closed position.

9. In combination with a firearms-magazine, having the upper portion of its side wall cut away, a closer for the opening thus made, pivotally mounted upon the side wall, having an inclined cam-surface upon its outer side, and a correspondingly-inclined lock adjacent to the cam of the closer and engaging therewith to force the closer to its closed position.

10. In a firearms-magazine, having the upper portion of its side wall cut away, a closer for the opening thus made, hinged at its forward end, and provided with an inclined cam-surface, a lock adjacent thereto, having a correspondingly-inclined surface for engaging with the closer, and a spring arranged and operating to normally press the lock toward its locking position with relation to the closer.

11. In a firearms-magazine, having the upper portion of its side wall cut away, a pivotally-mounted closer for the opening thus made, provided with an inclined cam-surface, a lock for the closer pivotally mounted adjacent thereto, and provided with a correspondingly-inclined cam-surface, a key operatively connected with the lock and so disposed in relation to the magazine as to unlock the closer when pushed in a direction opposite to that in which the cartridges enter the magazine, substantially as described and for the purpose specified.

12. In a magazine, a cartridge cut-off pivotally mounted upon the side wall, and a spring operatively engaging therewith and normally operating to press the cut-off out of engagement with the cartridges.

13. In a firearms-magazine, a cartridge cut-off pivotally mounted thereon, having one end extending through the side wall in engaging relation to the uppermost cartridge, a spring operatively engaging therewith and normally operating to press the cut-off out of its cartridge-engaging position, and an operating-key for engaging with and moving the cut-off into its cartridge-engaging position against the pressure of the spring.

14. In a firearms-magazine, in combination

with the side wall thereof, a cut-off pivotally mounted thereon, having a curved end extending through the side wall into engaging relation with the uppermost cartridge contained in the magazine, a spring normally pressing the cut-off out of its cartridge-engaging position, and an operating-key therefor having a retaining-recess adapted to engage with the end of the cut-off at the cartridge-engaging position of the latter.

15. In a firearms-magazine, in combination with the side wall, and with a cut-off pivotally mounted thereon, an operating-key for the cut-off fitted to slide in the side wall, and having an inclined face terminating in a transverse recess, the cut-off being provided with a hooked or rounded end engaging with the inclined surface and in the recess, with a spring normally pressing the cut-off into engagement with the key.

16. In a firearm of the class specified, a turning breech-bolt and an extractor therefor arranged for longitudinal movement only, provided at their forward ends with interlocking-ribs for preventing lateral movement of the forward end of the extractor away from the bolt, one of the ribs being extended annularly around the bolt so as to enable them to remain in locking engagement throughout the turning movement of the bolt.

17. In a firearm of the class specified, in combination with the receiver thereof, having a longitudinal extractor-receiving groove therein, a breech-bolt arranged to slide longitudinally and to partially rotate in the receiver, provided with a locking-rib adjacent to its forward end, an extractor sliding in the groove of the receiver, and having a locking-shoulder engaging with the locking-rib of the bolt, so as to prevent lateral movement of the hook of the extractor away from the bolt, the extractor having an extent of longitudinal movement with relation to the bolt sufficient to lock and unlock their engaging portions, whereby the extractor is moved into locked relation with the bolt by the extraction-resisting tendency of the cartridge, and is unlocked therefrom by the action of pushing the cartridge into its chamber.

18. A breech-bolt for firearms provided with an annularly-extending extractor-carrying rib, adjacent to the forward end of the bolt, and provided with an annularly-extending locking-rib for locking the extractor laterally to the bolt-head during the retracting movement of the bolt.

19. In a firearm, in combination with the receiver thereof, provided with a longitudinal groove and with an extractor therefor provided with a locking-shoulder at its forward end, a breech-bolt provided with a recessed groove at its forward end to receive the locking-shoulder of the extractor, the groove being extended annularly around the bolt to allow of the turning movement of the bolt with relation to the extractor.

20. Means for uniting a bolt and its head,

the former being provided with a transversely-shouldered recess, and the head being provided with a locking-lug entering the recess in the wall of the bolt, and a locking-piece supported by the shoulders of the recess, and preventing opening movement of the bolt-head.

21. Means for uniting a bolt and its head, the latter being provided with a stem having a projecting lug thereon, the bolt being recessed to receive the stem and the lug, and having a transversely-shouldered locking-recess adjacent to the lug with a locking-piece for the recess, all arranged and operating to lock the lug against opening movement.

22. A bolt for firearms chambered to receive a firing-pin, and having a recess in its forward end, substantially in the form of a cross, that bolt-head having a stem fitting the chamber of the bolt, with a lug thereon fitting the upper portion of the cross-shaped recess, and a T-shaped locking-piece for filling the remainder of the recess.

23. In a firearm of the class specified, in combination with the bolt and with the extractor thereof, the bolt being provided with a detachable head having a retaining-lug thereon fitting in the wall of the bolt, a locking-piece fitted in the wall of the bolt against the opening side of the retaining-lug of the bolt-head, and located beneath the extractor, whereby the latter is utilized to retain the locking-piece in its recess.

24. In a firearm of the class specified, in combination with a rotating bolt thereof, and with a non-rotating extractor, the bolt being provided with a detachable head, having a locking-lug fitting in a corresponding recess in the wall of the bolt, a locking-piece located in advance of the retaining-lug of the bolt-head, and extending circumferentially around the bolt to an extent sufficient to enable it to

be overlaid by the extractor at all of the working positions of the latter.

25. In a firearm, a breech-closing bolt chambered from its forward end to receive the firing-pin and its spring, a firing-pin provided with an enlarged collar near its forward end, the bolt being counterbored therefor to an extent sufficient to allow only of the necessary working compression of the spring, and forming a stop-abutment against excessive retraction of the pin, a detachable bolt-head rigidly locked to and forming the forward end of the bolt, provided with an annular locking-rib at its forward end, and an extractor having a locking-rib at its forward end for engaging with the rib of the bolt-head, so as to prevent lateral movement of the extractor away from the bolt-head, the extractor being arranged for longitudinal as well as rotary movement with relation to the bolt-head whereby their locking-ribs may be moved into and out of engagement.

26. In a firearm, the herein-described means for uniting the firing-pin and its cocking-piece, they being provided with corresponding engaging threads, and having longitudinal thread-interrupting grooves, which allow the cocking-piece to be slipped longitudinally to its seat upon the pin, one of the grooves being extended beyond the threaded portion to an extent sufficient to receive the key, and that groove being adapted to coincide with a corresponding groove in the cocking-piece when the latter is turned to its thread-engaging position upon the pin, whereby the key may be pushed through the groove and thus lock the parts against rotary movement.

E. G. PARKHURST.

Witnesses:

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W. H. HONISS.