

J. J. REIFGRABER.

AUTOMATIC FIREARM.

APPLICATION FILED SEPT. 26, 1907.

Patented July 27, 1909.

6 SHEETS—SHEET 1.

929,491.

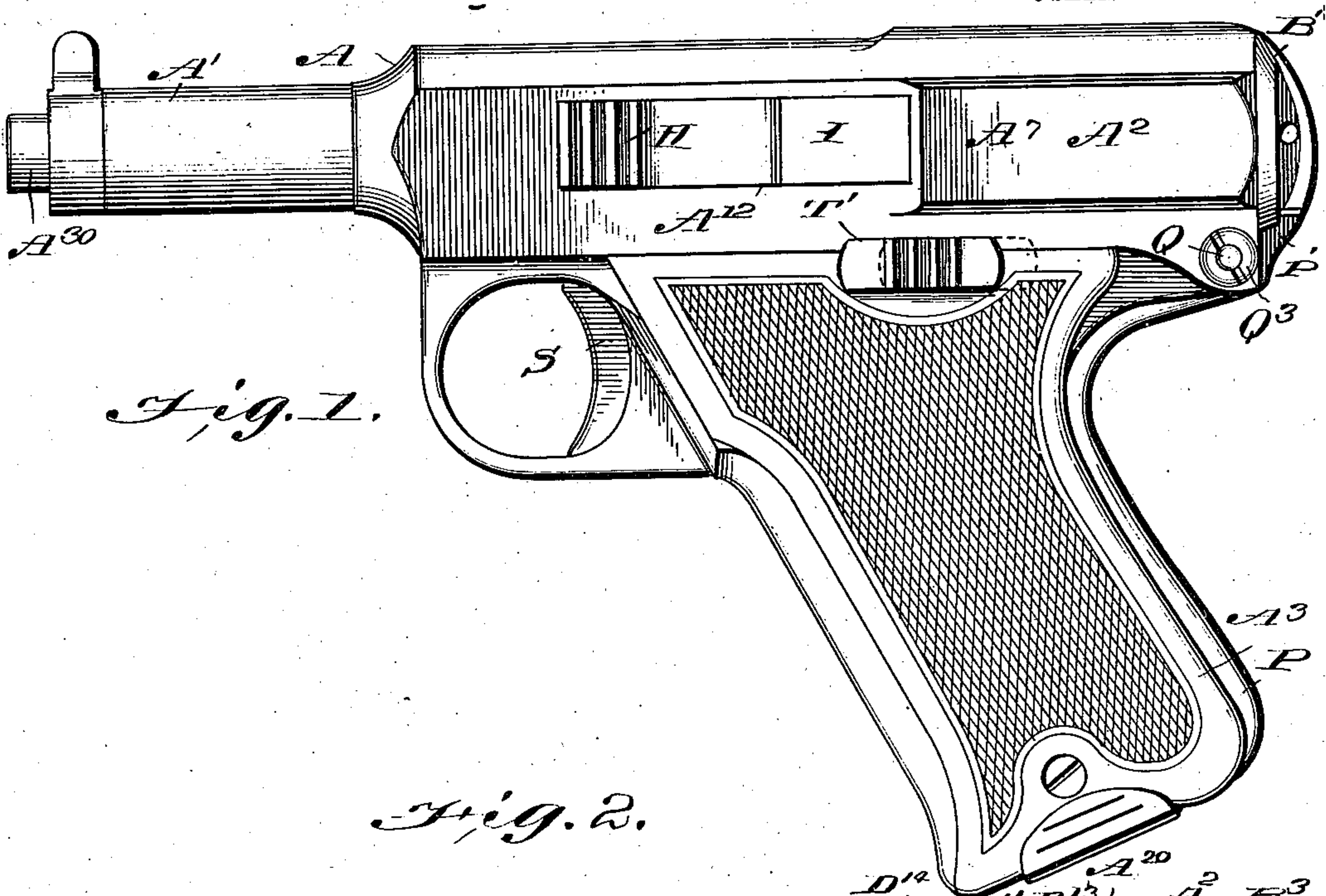


Fig. 1.

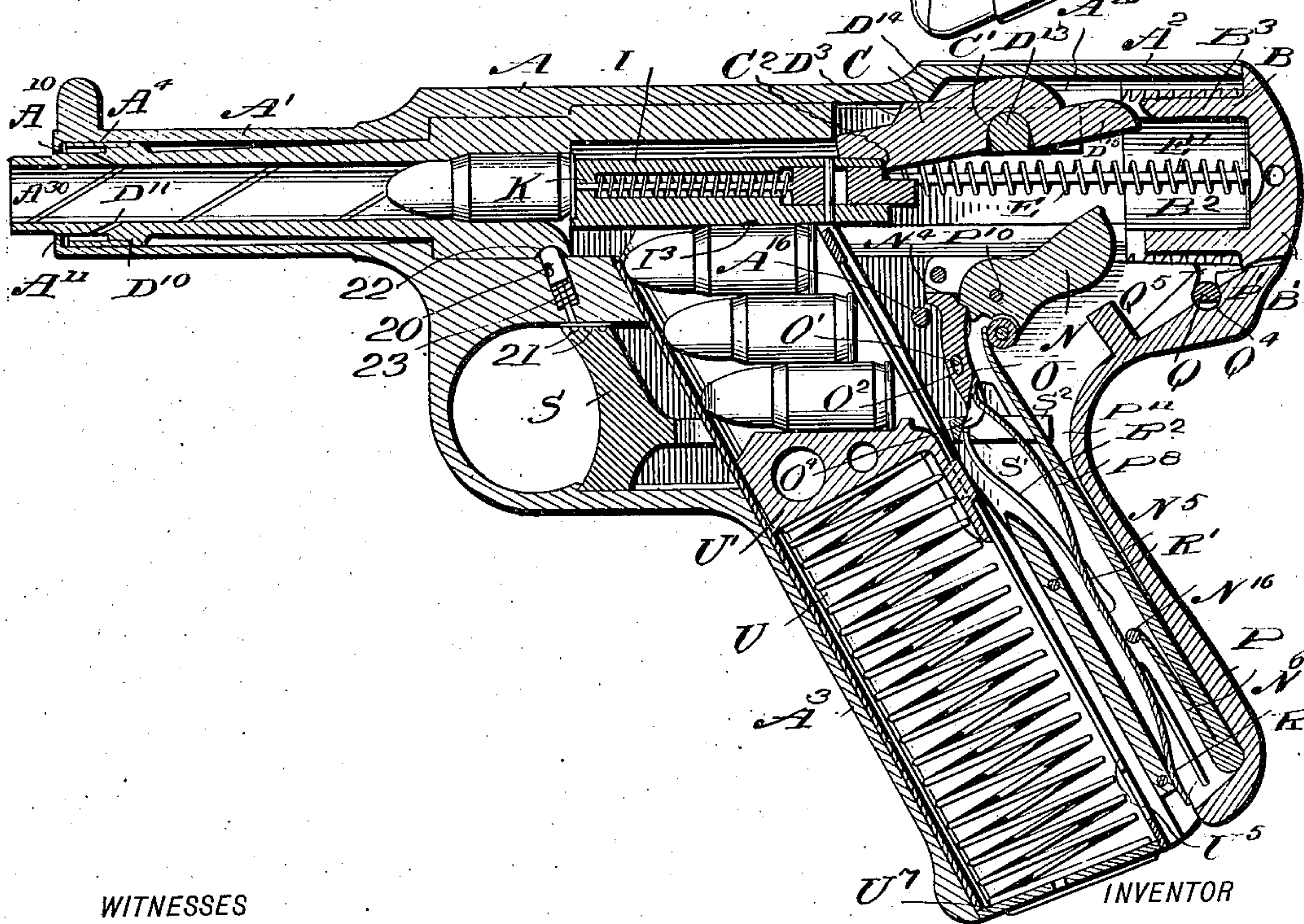


Fig. 2.

WITNESSES

F. C. Barry
Perry B. Durpin

INVENTOR

JOSEPH J. REIFGRABER

BY

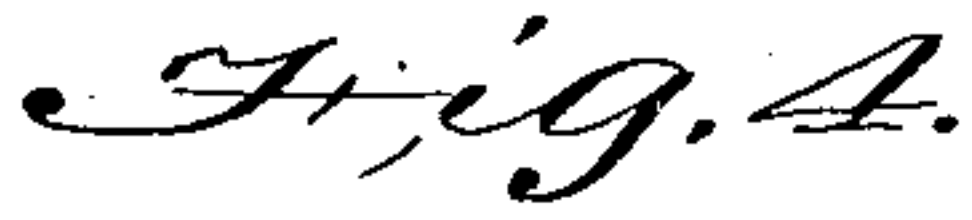
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6 SHEETS—SHEET 2.



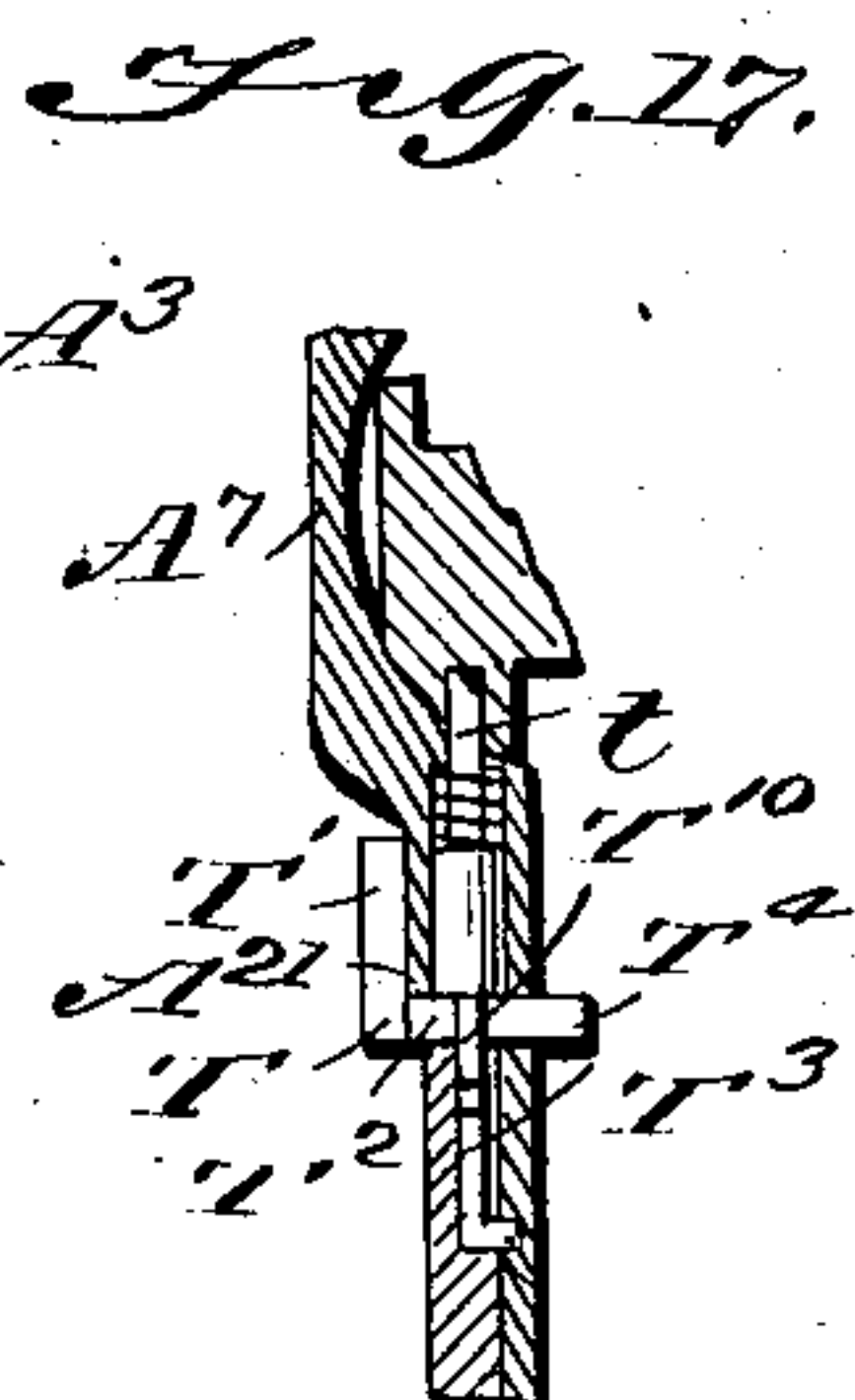
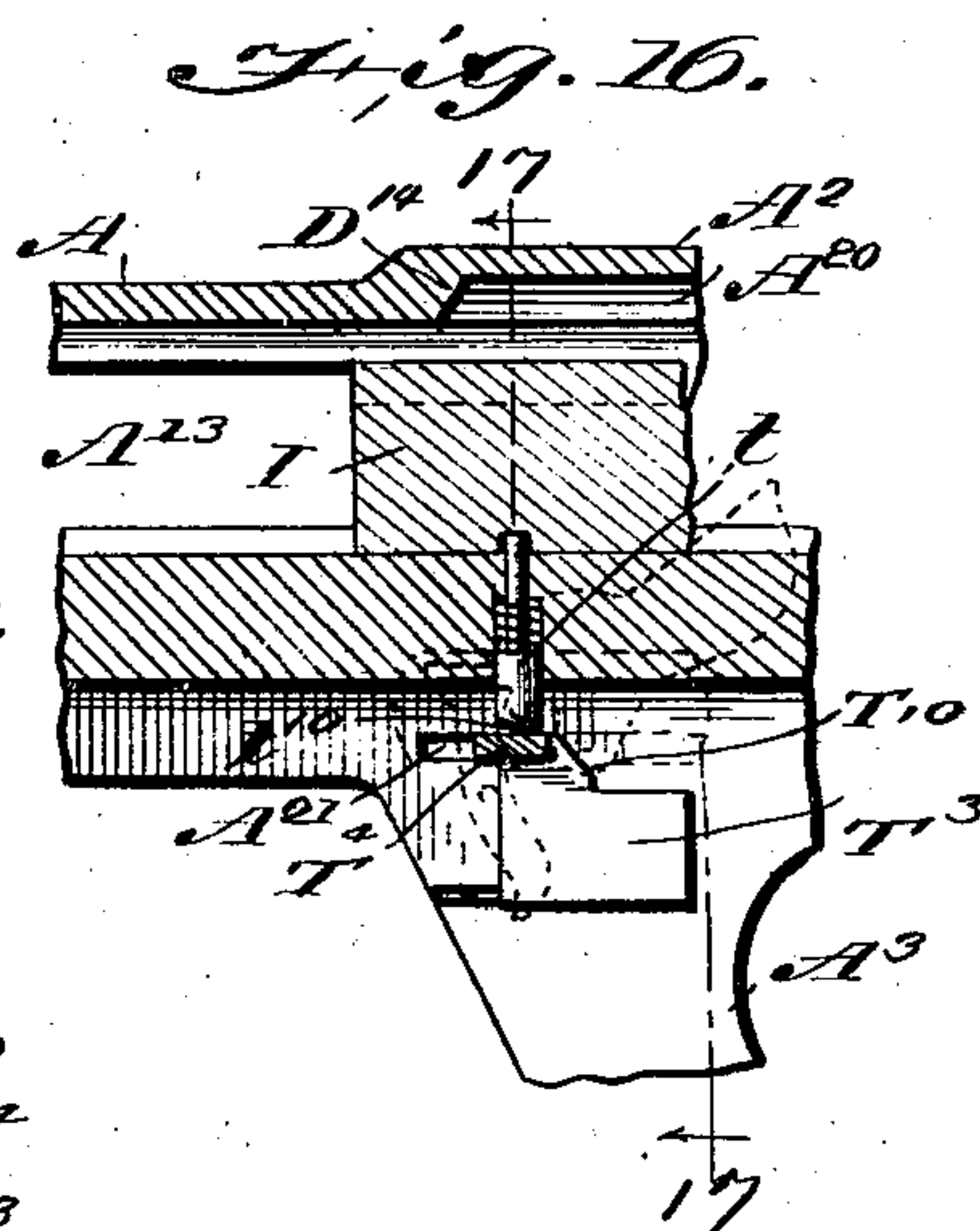
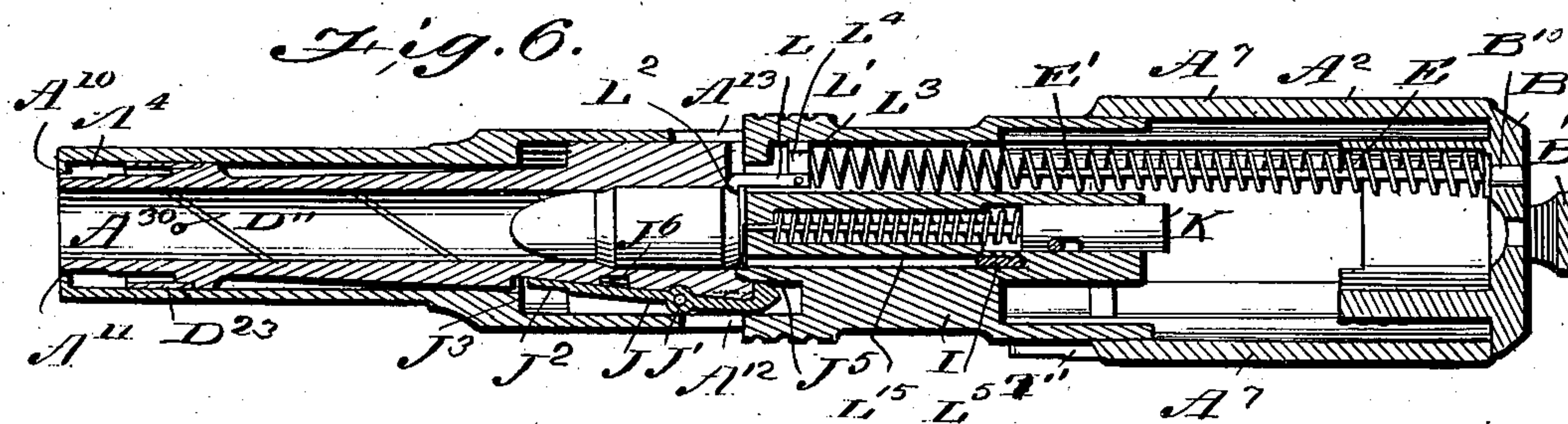
Perry B. Zupin

ATTORNEYS

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6 SHEETS--SHEET 3.



T. E. Barry
Perry B. Turpin

BY *Munn & Co*

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6 SHEETS—SHEET 4.



WITNESSES

WITNESSES
J. C. Barry, Fig. 10
Perry B. Surpin, B.

INVENTOR
JOSEPH J. REIFGRABER

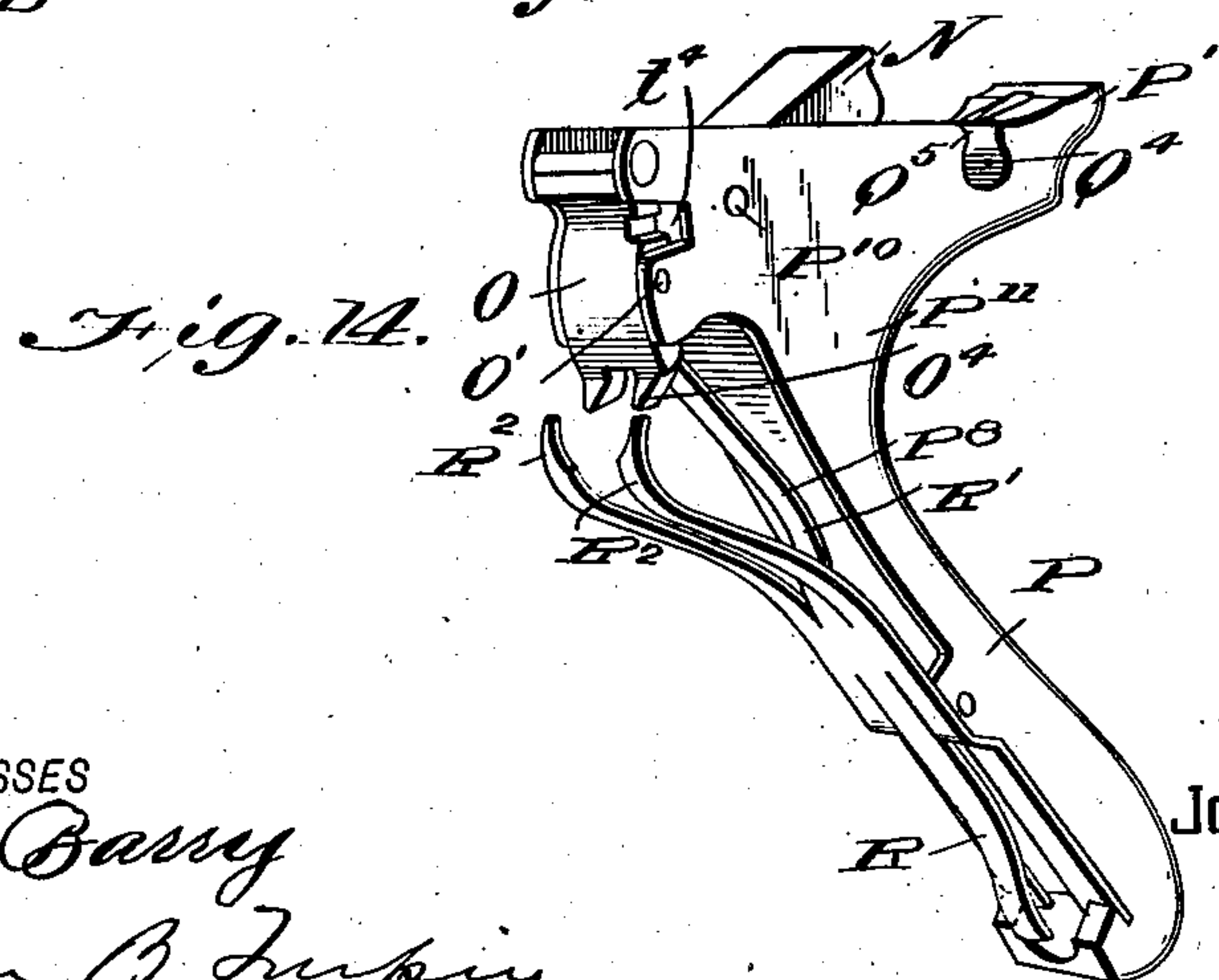
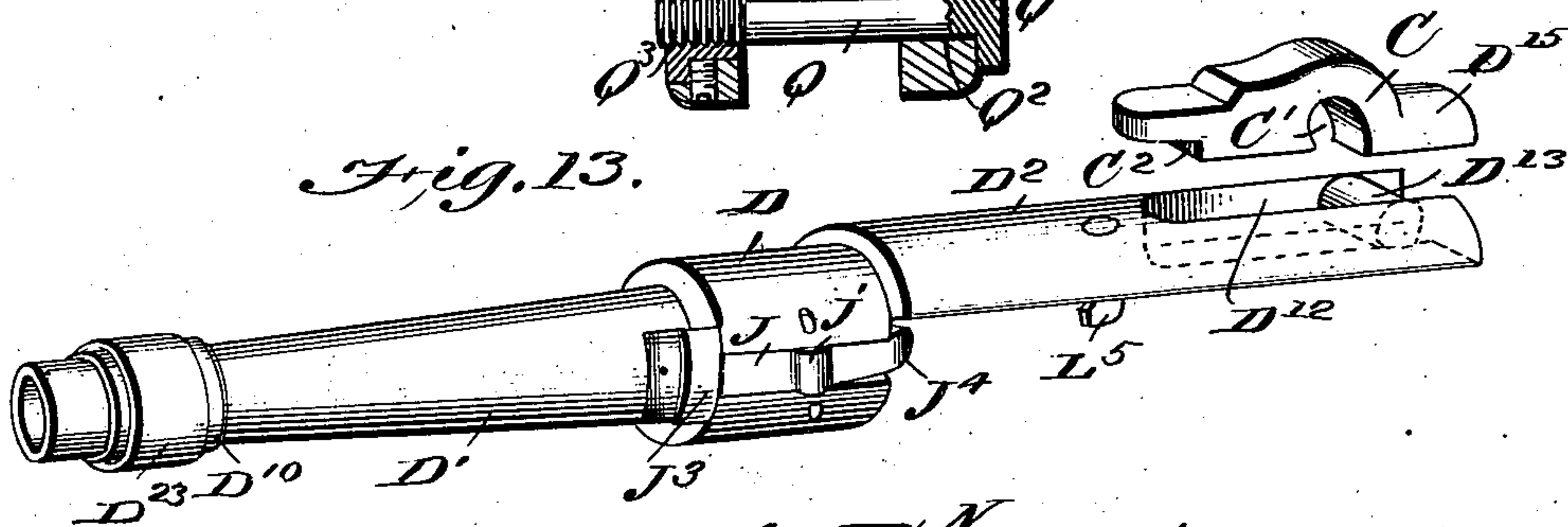
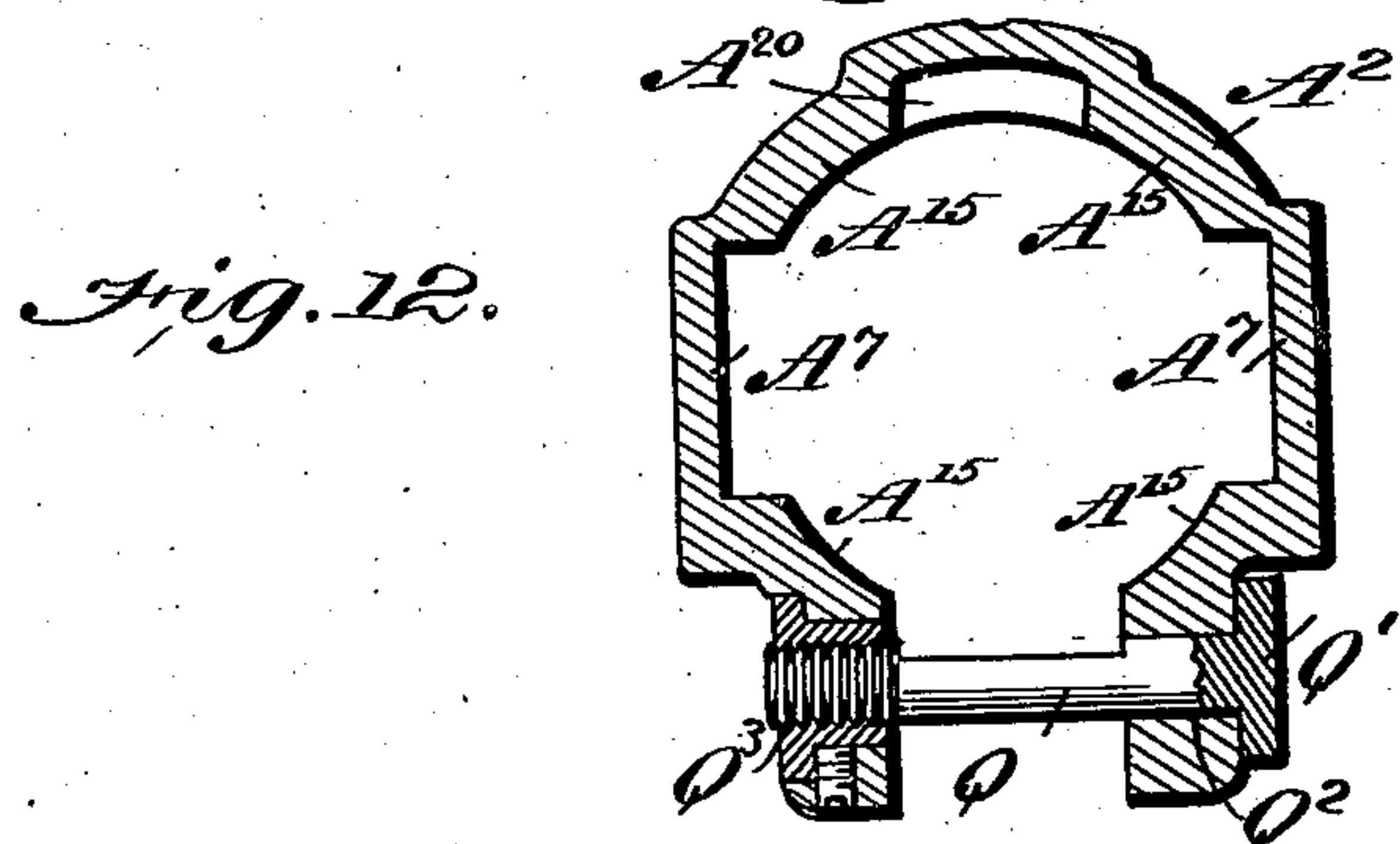
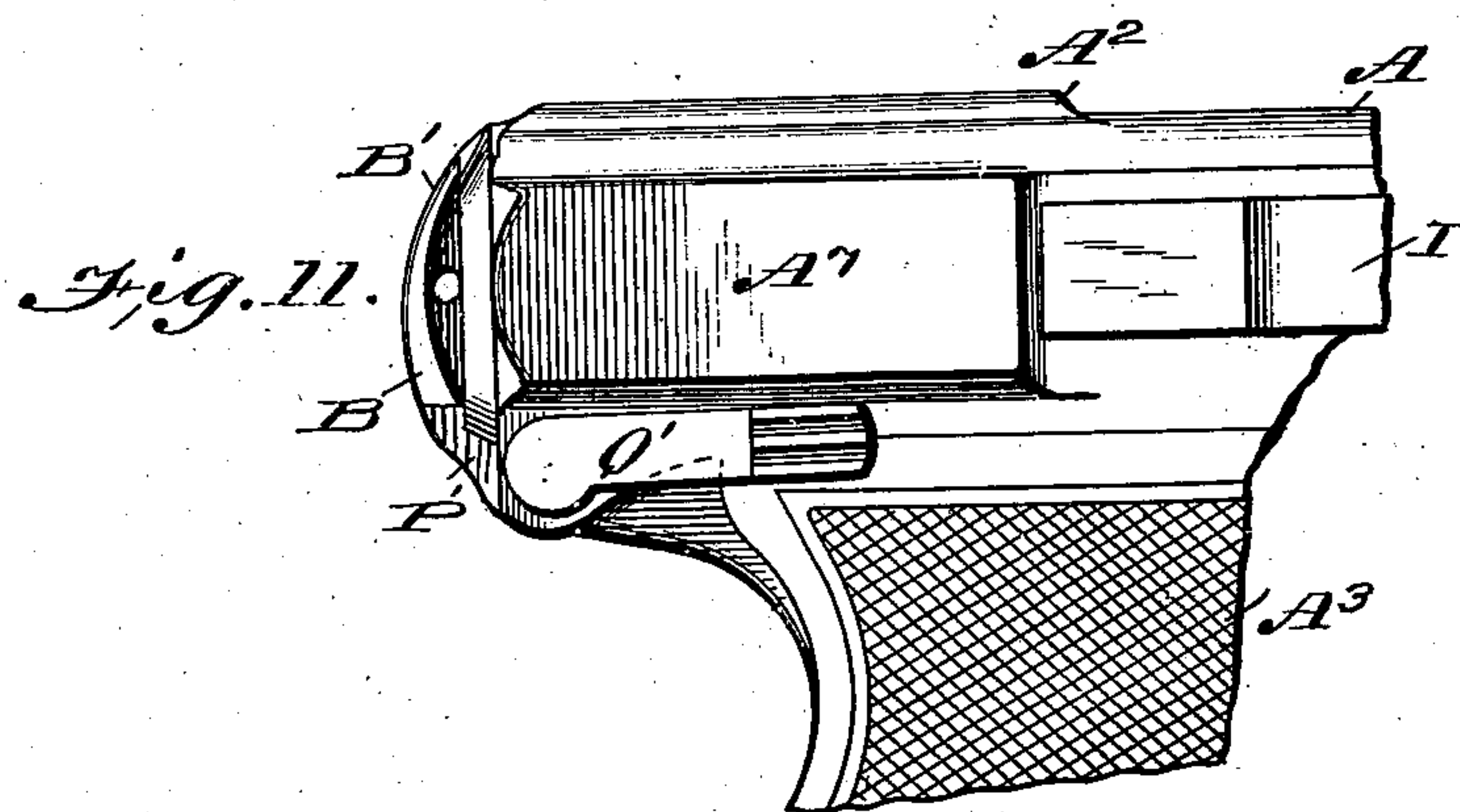
BY *Muntz Co.*

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6 SHEETS—SHEET 5.



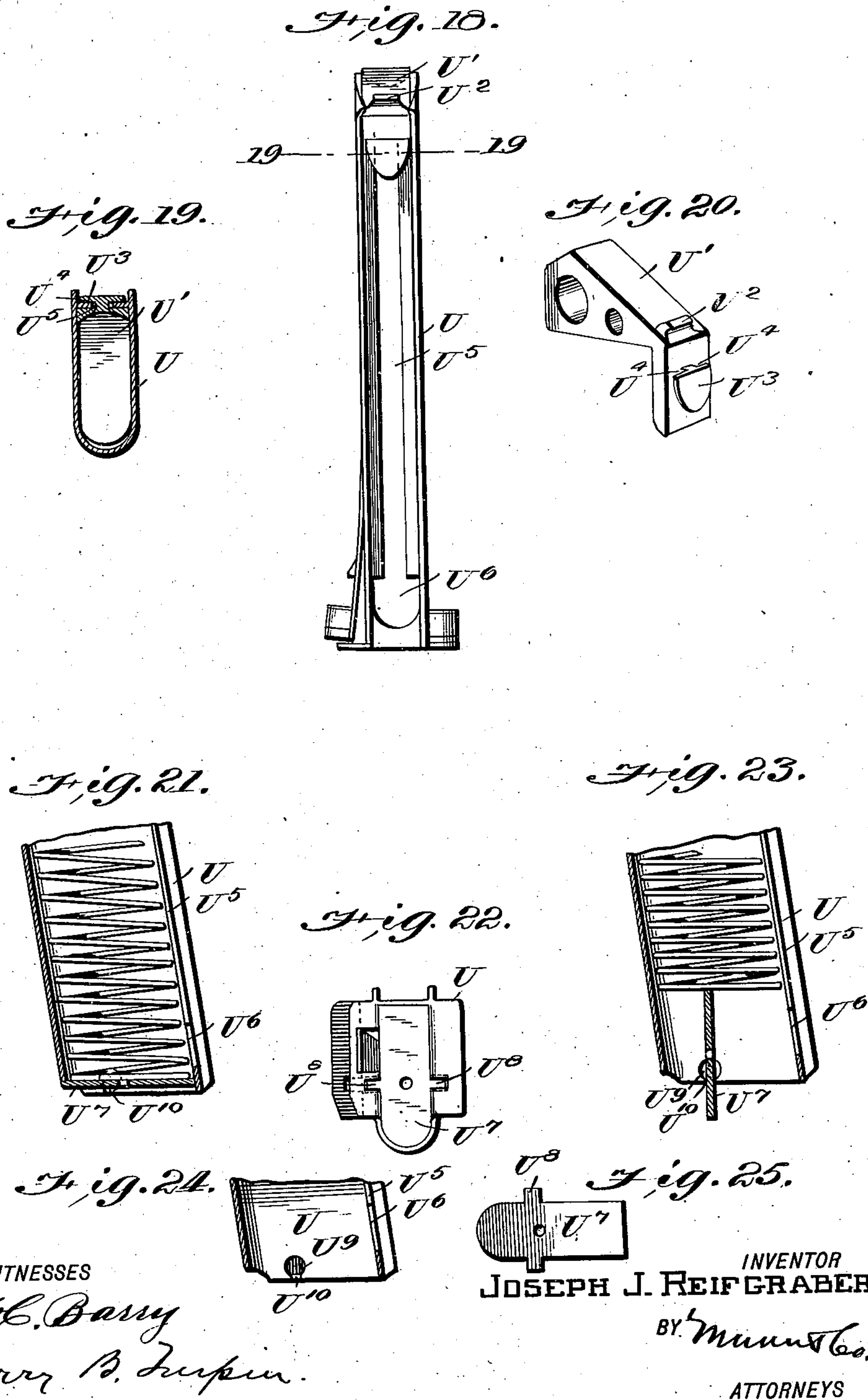
WITNESSES
F. C. Barry
Perry B. Turpin.

INVENTOR
JOSEPH J. REIFGRABER
BY *Munn & Co.*
ATTORNEYS

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6 SHEETS—SHEET 6.



UNITED STATES PATENT OFFICE.

JOSEPH JOACHIM REIFGRABER, OF ST. LOUIS, MISSOURI.

AUTOMATIC FIREARM.

No. 929,491.

Specification of Letters Patent.

Patented July 27, 1909.

Application filed September 26, 1907. Serial No. 394,739.

To all whom it may concern:

Be it known that I, JOSEPH JOACHIM REIFGRABER, a citizen of the United States, and a resident of St. Louis, Missouri, have invented certain new and useful Improvements in Automatic Firearms, of which the following is a specification.

This invention is an improvement in fire arms of the automatic class, such for instance, as illustrated in my former patents No. 729,413, issued May 26, 1903 and No. 834,753, issued Oct. 30, 1906, and the present invention consists in certain novel constructions and combinations of parts, as will be hereinafter described and claimed.

In the drawings Figure 1 is a side view of the fire-arm. Fig. 2 is a vertical longitudinal section thereof, parts being in firing position. Fig. 3 is a vertical longitudinal section showing the parts in fired position just before the bullet leaves the muzzle of the arm, and before the gases have operated to force the sliding barrel, breech block, etc. rearwardly, and the casing forward. Fig. 4 is a vertical longitudinal section of the arm with the parts in position to receive a cartridge from the magazine and the breech block in its rearmost position. Fig. 5 is a horizontal longitudinal section of the arm with its parts in the position they assume after the firing operation and immediately after a shell has been ejected. Fig. 6 is a horizontal longitudinal section of the arm with the parts in the position shown in Fig. 4, except that the breech block has moved forward. Fig. 7 is a side view partly in section of the gun with the breech block in its rearmost position and the safety lever in safety position. Fig. 8 is a partial vertical longitudinal section of the fire arm showing a portion of the safety lever, a portion of the casing and the back plug in position and illustrating the cross-pin for connecting the divided rear end of the casing in position to permit the application and removal of the safety lever. Fig. 9 illustrates the rear portion of the casing in vertical longitudinal section and the back plug detached, the cross-pin and its lever being in the position to which it is adjusted to release or free the divided rear end of the casing so the back plug can be applied or removed. Fig. 10 is an elevation of the inner end of the back plug. Fig. 11 is a detail side elevation of the rear portion of the fire arm from the opposite side from Fig. 1 showing the handle portion of the

cross-pin in the position it occupies when the jaws of the casing are drawn together and the pin adjusted to hold the safety lever. Fig. 12 is a vertical cross-section of the divided end of the casing on about line 12—12 of Fig. 9. Fig. 13 is a detail perspective view of the sliding barrel and of the latch for securing the same in engagement with the breech block, the latch being detached from the barrel. Fig. 14 is a detail perspective view of the safety lever with hammer, sear and springs applied. Fig. 15 is a cross-section on about line 15—15 of Fig. 3. Fig. 16 is a detail vertical longitudinal section on about line 16—16 of Fig. 5. Fig. 17 is a cross-section on about line 17—17 of Fig. 16. Fig. 18 is a rear elevation of the magazine with the follower block in its extreme uppermost position. Fig. 19 is a detail cross-section on about line 19—19 of Fig. 18. Fig. 20 is a detail perspective view of the follower block. Fig. 21 is a detail longitudinal section of the lower portion of the magazine with the bottom plate in position. Fig. 22 is a bottom plan view of the magazine with the bottom plate in position. Fig. 23 is a longitudinal section of the lower portion of the magazine with the bottom plate adjusted to position it assumes in inserting and removing said plate. Fig. 24 is a detail section of the lower portion of the magazine casing showing the undercut openings for the lateral projections on the bottom plate, and Fig. 25 is a detail view of the bottom plate showing the lateral projections.

The present arm is similar in many respects to that shown in my prior patent No. 834,753 and in the following description I shall, in part at least, identify the parts in the present invention by the same reference letters or characters applied to the corresponding parts of the construction shown in my said prior patent. In the present invention the casing A receives the sliding barrel D and the latter is interlocked during a portion of its rearward movement with the breech block I, the latter having a rearward movement beyond that of the sliding barrel and the breech block during such further rearward movement operating to cock the hammer, the latter being carried in a movable safety lever all as more fully described hereinafter. It will also be noticed that when the hammer is down the safety lever cannot move to its released position, thus indicating by sight and touch that the ham-

mer is down and when the hammer is down the side lock T cannot be moved to its dotted line position.

The casing or frame A supports the several
 5 movable parts and comprises a barrel portion A', a body portion A² in rear of the barrel portion, and a handle portion A³. The barrel portion is provided at its front end with an inwardly projecting annular
 10 flange A¹¹ at the center of which is provided the opening A¹⁰ in which operates the front end of the sliding barrel presently described. The interior of the barrel portion A' immediately in rear of the flange A¹¹ forms a
 15 cylinder A⁴ in which operates the gas which pushes back the sliding barrel in the operation of the fire arm. The pressure also operates forwardly against the flange A¹¹ and thus in a measure counteracts the recoil. It
 20 will be noticed that the sliding barrel at its front end has a portion fitting the venting opening A¹⁰ in the flange A¹¹ and also has in advance of said fitting portion a reduced extension A³⁰. This enables me to provide
 25 any desired length of barrel in advance of the casing and yet secure the desired venting of the cylinder without increasing the length of the stroke of the sliding barrel on its rearward movement. The body portion A² is
 30 provided in its opposite sides with openings A¹² and A¹³ in which operate the gripping side wings of the longitudinally movable breech block and in rear of the slots A¹² and A¹³ the body portion is provided
 35 with laterally bulging portions A⁷ which form guides or receptacles for the gripping side wings of the breech block when the breech block is moved to its rearmost position. The rear end of the casing is provided
 40 with interrupted threads, the portion A⁷ and the groove A²⁰ interrupting the threads A¹⁵ which threads receive the interrupted threads on the back plug B when the latter is inserted and turned to place.

45 The back plug B is provided at its rear end with the handle portion B' by which it may be turned to set its threads into and out of engagement with those of the casing, and it is provided in its front end with a recess
 50 B² whose upper wall at B³ forms a cam bearing to operate upon the rear end of the rocking latch C, which forms a detachable connection between the breech block and the sliding barrel as more fully described hereinafter. The purpose of the cam bearing B³
 55 is to shift the latch C which latter is carried by the sliding barrel out of engagement with the breech block at the proper time so the breech block may be moved rearwardly independent of the sliding barrel after the latter has reached its rearmost position.

60 The rear end of the body portion A² of the casing is split or divided at its lower end forming the opposite jaws which are connected by the cross pin Q having a handle
 65

Q' and journaled at one end at Q² in one of the jaws of the plug-holding portion of the casing and having its other end turning in the threaded bearing at Q³ in the opposite jaw so that by properly turning the pin Q
 70 the jaws may be drawn toward each other to clamp the back plug and thus lock the same in place or be turned in the opposite direction to release the jaws so the back plug may be readily turned into or out of its seat in
 75 the rear of the casing, as may be desired. The threaded bearing for the cross pin Q may have a removable nut as shown so it can be readily replaced when worn, a set screw holding the nut as shown and permitting the adjustment of the nut. The pin Q
 80 also serves another function in that it forms a pivotal support for the safety lever P when turned to the position shown in Figs. 2, 3 and 4 and when given a quarter turn per-
 85 mits the removal and application of the safety lever. To this end the safety lever is provided in its upper edge near its rear end with an opening Q⁴ receiving the cross pin Q and having at its upper end a contracted
 90 opening Q⁵, the body of the opening Q⁴ being of a size to receive the pin Q when the latter is turned to the position shown in Figs. 2, 3 and 4 and the openings Q⁵, being smaller than the greatest width of the pin
 95 Q and sufficiently wide to permit the passage of the flattened pin Q when the latter is given a quarter turn from the position shown in Figs. 2, 3 and 4. The safety lever is provided with an extension P' in rear of
 100 the opening Q⁴ and which prevents any displacement of the safety lever when the pin Q is in the position shown in Fig. 2 by preventing the rocking of the lever to such position that the pin A⁴ can escape through
 105 the contracted opening Q⁵. It will be understood from the foregoing that the pin Q may be given a quarter turn from the position shown in Fig. 2, to permit the removal and application of the safety lever and may
 110 be then given a further quarter turn in order to release the jaws of the casing sufficiently to free the back plug and permit the same to be turned in order to remove it, as may be desired.
 115

The barrel D is movable longitudinally in the frame and is constructed with the front portion or barrel D' and the rear extension or receiver D², the latter projecting rearwardly from the upper side of the barrel and
 120 overlying the breech block I, which latter has a limited movement with and a further movement independent of the sliding barrel, as more fully described hereinafter. This rear extension D² is slotted at D¹² to receive
 125 the latch C and has a cross pin D¹³ on which the latch C rocks. This latch C fits partially in the recess D¹², is notched in its under side at C' to fit on the pin D¹³, is provided near
 130 its front end with the forwardly facing

shoulder C² to engage upon the rear end of the breech block I when the parts are in the position shown in Fig. 2, and has on its upper side in front of its pivot, a cam surface D³ to engage with the shoulder D¹⁴ on the casing whereby it may be depressed at its front end to the position shown in Fig. 2 by the forward movement of the barrel with the latch thereon. The rear end of the latch at D¹⁵ is adapted by engagement with the bearing B² in the back plug to rock the latch from the position shown in Fig. 2 to the position shown in Fig. 4 when the parts are in the position shown in said Fig. 4, and thus release the breech block so the latter may continue its rearward movement beyond the corresponding movement of the sliding barrel. It will be noticed that the latch by the form of pivot shown and described is conveniently detachable from the sliding barrel when the latter is removed from the casing and may be removed and replaced by simply dropping it in and lifting it out of position. In permitting the operation of the latch it will be noticed I provide the casing A in the under surface of its upper wall near its rear end with the groove or recess A²⁰ into which the latch C adjusts when the barrel is in its rearmost position and the breech block is freed from said barrel by such adjustment of the latch and as the barrel moves forward by the forward movement of the breech block presently described it operates to adjust the latch C from the position shown in Fig. 4 to that shown in Fig. 2 in which the said latch will hold the breech block in connection with the sliding barrel until the latter has again readjusted to its rearmost position in the operation of the invention.

In the operation before described, it will be understood the barrel is forced rearwardly, and the breech block with it by the action of the gas in the cylinder A⁴, the gas being generated by the explosion of the cartridge and passing through an opening D¹¹ in the barrel D and operating between the front flange A¹¹ and a piston D²³ secured upon the barrel and seated at its rear side against a forwardly facing shoulder D¹⁰ on the barrel. This piston D²³ is recessed or cupped in its front face for a considerable depth forming a thin outer ring which will be expanded by the pressure of the gas against the interior of the cylinder A⁴ and thus avoid the necessity of separate packing and will also operate to protect the inner wall of the cylinder A⁴ and prevent to a considerable extent the corrosion thereof by the action of the gas. The gas passing to the cylinder A⁴ when the parts are in the position shown in Fig. 2 will operate to force the sliding barrel rearwardly and the latter carrying with it the breech block will be adjusted to the position

shown in Fig. 4, the breech block continuing its rearward movement to the position shown in Fig. 4. To prevent the rebounding of the sliding barrel and its readjustment, in advance of the forward movement of the breech block from the position shown in Fig. 4 to that shown in Fig. 2, I provide the barrel lock J which when the parts are in the position shown in Fig. 5 locks the barrel against forward movement and is adapted to hold the barrel against the forward movement until the said barrel lock is released by the action of the breech block, when the latter reaches its foremost position. This barrel lock has an important function in that it prevents the forward movement of the barrel by the rebounding or other action until the breech block is readjusted into proper relation with the sliding barrel. It will be understood that if the sliding barrel were permitted to move forward before the breech block moves forward into connection with the sliding barrel, as shown in Fig. 2, the latch C would likely be forced down upon the breech block and bind the same and it is to avoid any such action that I provide the barrel lock J. This lock is shown as a lever pivoted between its ends at J¹ to the sliding barrel, arranged at its front end J² to engage in rear of the rearwardly facing shoulder J³ on the casing when the sliding barrel is in its rearmost position and the breech block is also in its rearmost position and the said lever has its rear end J⁴ arranged to be engaged and actuated by the portion J⁵ at the front end of the breech block when the latter reaches its foremost position, as shown in Fig. 6 so the breech block when adjusted to the position shown in Fig. 6 will free the front end of the barrel lock J from engagement at J³ with the casing so the barrel may move forward under the influence of the breech block, the latter being actuated by its spring as presently described. The barrel lock J is spring actuated at J⁶ from the position shown in Fig. 6 to that shown in Fig. 5 when the parts are in the position shown in Fig. 5 of the drawings.

The hammer N, sear O and springs for operating the hammer, sear and safety lever are carried in the safety lever P, which is pivoted on the cross pin Q and is also held by said cross pin Q when the latter is rocked to the position shown in Fig. 2. The extension P¹ of the safety lever limits the rearward or outward movement of the lever and stops the same in the position shown in Fig. 7, in which position, the hammer engages with the shoulder I³ on the under side of the breech block and prevents any forward movement of the breech block so long as the safety lever is in the position shown in Fig. 7. However, the safety lever may

be pressed by the act of gripping the handle from the position shown in Fig. 7 to that shown in Fig. 2, releasing the breech block so the latter may be moved by its actuating spring forward to the position shown, for instance, in Fig. 2.

The hammer N is pivoted by the cross pin P¹⁰ to the side plates P¹¹ of the safety lever and has the sear shoulder N⁴ below which the sear operates and is also provided with the roller N² for engagement by the hammer spring.

The sear O operates to hold and release the hammer and also acts as an escapement for the trigger. To this end the sear is pivoted midway between its ends so it may be rocked into and out of engagement with the hammer and is movable longitudinally along its pivot, so it may be moved down into firing position by the pressure of the hammer on the sear, the hammer spring presently described being stronger than the sear spring and the sear also permits the passage of the trigger in the movement of the same to its retracted or firing position. The sear is pivoted on the pin O' and is slotted at O² for the passage of said pin, the slot O² being elongated in the direction of length of the sear, so the sear can move longitudinally and also rock in the operation of the device. At its upper end the sear is adapted to hold and release the hammer by engagement with the shoulder or projection N⁴ thereof, as shown in Figs. 4 and 7. When the parts are in the position shown in Fig. 7 the upper end of the sear bears directly in rear of a locking pin or portion A¹⁰ of the casing. In this position it will be noticed the sear is locked so that it cannot be rocked on its pivot to release the hammer, the position shown in Fig. 7 being that occupied by the parts when the safety lever P is released from pressure and is forced rearwardly by its spring P⁸ presently described. In this position, therefore, the trigger cannot operate to release the hammer, nor can it so operate, nor can the hammer be otherwise released until the safety lever is pressed forwardly to the position shown in Figs. 3 and 4. This pressing of the safety lever forward throws the upper end of the sear above the locking portion A¹⁰ of the casing to position shown in Figs. 3 and 4, so the sear may operate to release the hammer.

For operating the sear I provide the trigger S having the cross bar S' near the rear ends of its side bars S², the trigger being capable of longitudinal movement and also having a limited up and down movement at its rear end.

A trigger lock is provided in the casing and comprises a sliding pin 20 which is spring actuated to force its upper end into the path of the barrel and is arranged at its lower end to operate in front of the

trigger or in any suitable notches 21 therein. The sliding barrel is recessed at 22 to receive the upper end of the trigger lock when the sliding barrel is forward as shown in Fig. 2, so the spring 23 will move the lock out of engagement with the trigger. When, however, the sliding barrel is moved rearwardly from the position shown in Fig. 2 it will force the trigger lock downward against the action of the spring 23 and into the path of the trigger to lock the same, as will be understood from the drawings.

The hammer spring N⁵ is arranged at its upper end to operate the hammer in the usual manner and has at its lower end the upturned portion N⁶ whose free end is held by the cross pin N¹⁰ on the safety lever so the spring N⁵ may be conveniently secured and may be released from the safety lever whenever desired without the use of any separate instrument after the hammer has been removed, and the tension of the spring N⁵ thereby released.

The safety lever is pressed to its outer or normal position by the spring R which bears between the lower end of the safety lever and the frame and by preference the spring arm for actuating the safety lever, the sear spring R' for actuating the sear, and the trigger spring R² are made in one piece, as best shown in Fig. 14 of the drawings, to which end the spring plate is fitted to form the springs R' and R², as shown. The trigger spring is preferably made of two side sections and the upper ends of the springs R' and R² are preferably deflected so that they will exert a forward and upward tension on respectively, the sear and the rear end of the trigger in the operation of the gun, as presently described. In securing the spring R in the safety lever, the latter is provided at its lower end with the upwardly facing notch in which the lower end of the spring plate is seated, as best shown in Fig. 14 of the drawings.

At its lower end the sear is provided with the projecting fingers or portions O⁴ for engagement by the trigger and these fingers are preferably spaced apart to permit the operation between them of the sear spring R' which operates upon the sear, as shown in the drawings.

When the hammer is in firing position its shoulder or projection N⁴ pressing upon the upper end of the sear will force the latter downward into position to be engaged by the cross bar S' of the trigger S when the latter is pulled. After the trigger is pulled and the hammer is down the sear will be forced upward by the action of its spring and permit the cross bar of the trigger S to escape in the forward or readjusted movement of the trigger, the latter having a limited up and down movement at its rear end to facilitate this escapement action in read-

justing the trigger in the operation of the invention. In this operation it will be understood the sear is pressed downward by the pressure of the main spring acting through the hammer so the lower end of the sear will be in position to be operated by the trigger after the latter is pulled, and when the hammer is released by the sear the latter will be forced upward by the sear spring and set to a position in which the trigger can pass the lower end of the sear. In this operation the trigger spring operates to force the trigger forward and also to press the rear end of the said trigger upwardly with a yielding action.

The side lock T is arranged to engage with the safety lever and also with the hammer, as well as with the breech bolt in order to lock the safety lever and the hammer and the breech block when the said side lock is moved from the position shown in full lines in Fig. 1 to the dotted line position shown in the same figure. This side lock is shown in detail in Fig. 17, and consists of the outer or gripping plate T', the inwardly projecting plate or wing T², which operates in the slot A²¹ in the frame A, and the depending wing T³, which operates along the inner face of the side plate of the frame and carries the inwardly projecting pin T⁴ which moves into the slot t⁴ in the safety lever and the slot N¹² in the hammer when the side lock is moved rearwardly to the dotted line position shown in Fig. 1 and so operates to lock the safety lever and the hammer from movement. When moved to such dotted line position, the side lock also operates upon a pin t, which is movable in the frame into and out of engagement with the breech block and presses such pin upwardly into engagement with the said block, a spring acting upon the pin to force the same normally downward and release the breech block. In this operation an edge or surface T¹⁰ on the side lock, Fig. 16 engages the inclined lower end t¹⁰ of the pin t (see Fig. 16) and as the lock is moved longitudinally forces the pin t up, as will be understood from Fig. 16. The side lock not only operates as a lock, but also acts as an indicator to show the operator both by sight and touch when the safety lever and hammer are locked and when such parts are unlocked and ready for action, the side lock operating thus in connection with the safety lever to indicate to the operator when the gun is ready to be fired.

The breech block I has the gripping wings II and H' integral with it and the said block is provided with a firing pin K and with an extractor L. The latter is arranged at one side of the cartridge seat and is pivoted at L' and has a hook L² to engage with the flange on the cartridge shell and is also provided with the arm L³ which is perforated

at L⁴ for the passage of the guide pin E' of the spring E. This spring E encircles and is guided by the pin E' and bears between the arm L⁴ of the extractor L and the back plug B. The back plug B has an opening B¹⁰ in which fits the rear end of the guide pin E' and the pin E' protrudes through the opening in the arm L⁴ of the extractor when the breech plug is pushed back to the position shown in Fig. 5 and operates to hold the extractor in such position so it will hold the edge of the shell while the ejector L⁵ on the under side of the rear extension of the sliding barrel and which operates in a groove L¹⁵ on the upper side of the breech block ejects the shell. In this operation the protruding front end of the pin E' being engaged by the shell operates as a deflector for the shell and prevents the latter from being thrown back against a person standing alongside the one firing the arm. It will be noticed that the spring E operates directly upon the breech block and between the breech block and the back plug and is also so arranged as to actuate the extractor so the latter may yield as the breech block moves forward to the position shown in Fig. 6, in which position the extractor springs into engagement with the flange on the shell as will be understood from Fig. 6 of the drawing and in this position the front end of the guide pin E' does not interfere with the yielding of the extractor. This arrangement of the spring also permits the ready removal of the spring for any desired purpose and simplifies the construction of the arm to a very considerable extent, as will be understood from the drawings.

The cartridge magazine U fits within its recess in the handle of the gun, is adapted to receive a number of cartridges and has a spring pressed follower U' which forces the cartridges upwardly to feed the latter into the gun. This follower is provided at its rear end with a shoulder or projection U², which moves upward into the path of the breech block when the magazine is empty and by engaging with said breech block prevents the forward movement of the latter when the last cartridge has been ejected from the magazine and fired in the operation of the invention, thus indicating at once to the operator that the magazine has discharged its last cartridge. At its rear side the follower U is provided with the rearwardly projecting finger or thumb piece U³, undercut at U⁴ with its undercut portion sliding in a slot U⁵ in the back plate of the magazine and forming a thumb piece by which the follower block may be conveniently pushed down for the insertion of the cartridges. At its lower end the slot U⁵ has an enlarged portion U⁶ through which the projection U³ may be passed in inserting the follower block in the magazine casing from

the lower end of the latter. The lower end of the magazine casing is closed by the removable plate U^7 provided with lateral projections U^8 which fit in openings U^9 in the side plates of the magazine casing, the said openings U^9 having contracted outlet slots U^{10} through which the projections U^8 may pass when the plate U^7 is arranged edge-wise, as shown in Fig. 23 and then may be turned to the position shown in Figs. 21 and 22 to lock the plate in place, the front end of the plate U^7 bearing when the parts are arranged, as shown in Fig. 7, against the lower end of the front plate of the magazine casing.

From the foregoing description it will be noticed that the gripping plates which are integral with the breech block are arranged at the opposite sides of the casing and operate in the opposite side openings in the casing and within the laterally bulging portions A^7 in rear of the lateral openings in the casing and the safety lever which is spring pressed normally to the outer position carries the firing devices and may be depressed in grasping the grip of the arm to bring the firing devices into position for the firing operation.

In operation when the breech block has reached its rearmost position the cartridges may be fed up from the magazine and the breech block may then move forward with the barrel and the breech block latch will adjust in rear of the breech block and travel therewith and with the barrel forwardly locking the breech block from any rearward movement until the barrel has again been pushed back in position in which the locking latch C may be released to release the breech block.

While the pistol form is chosen for illustration only it should be understood the use of any or all of the improvements are not restricted to any particular kind of fire-arm and the right is reserved for various changes in form and arrangement of parts within the scope of the invention.

I claim:

1. A fire arm comprising a sliding barrel, a trigger, and a trigger lock operated by the sliding barrel, the portion of the trigger engaging with the lock being movable at an angle to the said lock whereby a pull on the trigger will not cause the lock to bind frictionally against the barrel, the lock being adapted in operation to prevent the pulling of the trigger if the barrel is in rear of its normal position, and also operating to prevent any forward movement of the trigger when the barrel is moved rearwardly.

2. The combination in a fire arm with the casing, a trigger and a sliding barrel, of a trigger lock consisting of a pin movable longitudinally in the casing and arranged to project at one end into the path of the

trigger and at its other end into the path of the sliding barrel whereby it may be operated by the latter into engagement with the trigger, the portion of the trigger engaging with the lock being movable at an angle to the said lock whereby a pull on the trigger will not cause the lock to bind frictionally against the barrel, the lock being adapted in operation to prevent the pulling of the trigger if the barrel is in rear of its normal position, and also operating to prevent any forward movement of the trigger when the barrel is moved rearwardly.

3. The combination in a fire arm, of a casing, a trigger, a trigger lock consisting of a pin movable in the casing and arranged at one end to engage with the trigger, and a barrel slidable in the casing and having a recess entered by the trigger lock in one position of the barrel, the barrel being movable from such position whereby to actuate the trigger lock into engagement with the trigger, the portion of the trigger engaging with the lock being movable at an angle to the said lock whereby a pull on the trigger will not cause the lock to bind frictionally against the barrel, the lock being adapted in operation to prevent the pulling of the trigger if the barrel is in rear of its normal position, and also operating to prevent any forward movement of the trigger when the barrel is moved rearwardly.

4. In an automatic fire-arm the combination of the casing having a cylinder for the operation of the gases and a venting opening therefor, a barrel reciprocating in said cylinder and having a port leading to the cylinder and also having a portion fitting the venting opening therefor, and a reduced extension beyond said portion.

5. In an automatic fire-arm the combination of the casing having a cylinder for the operation of the gases evolved from the explosion, a barrel reciprocating in the casing, and a cup-shape piston on said barrel within the cylinder and at a point in rear of the muzzle of the barrel.

6. The combination of the casing, a sliding barrel having a rear extension provided with a slot, and a pin crossing the same, a breech block sliding with and independently of the barrel, and located in one position under the rear extension of the barrel, and a latch for holding the breech block in connection with the barrel, said latch fitting and operating within the slot in the barrel extension and having a notch receiving the cross-pin of such extension whereby to pivotally mount the latch.

7. A fire-arm comprising a sliding barrel, a trigger sliding approximately parallel with the barrel, and a trigger lock operated by the sliding barrel, the lock being adapted in operation to prevent the pulling of the trigger if the barrel is in rear of its normal

position, and also operating to prevent any forward movement of the trigger when the barrel is moved rearwardly.

8. The combination of the casing, a sliding barrel, a barrel lock adapted to lock the barrel in its rearmost position when the breech block is moved rearwardly beyond the barrel, a breech block engaging and releasing the latch on its forward movement, a latch carried by and movable with the sliding barrel for holding the breech block in connection with the sliding barrel, and means for positively releasing said latch when the barrel and breech block are moved rearwardly.

9. The combination of the breech block, the ejector, the extractor carried by the breech block, the breech block spring, and a guide pin for said spring arranged to protrude beyond the extractor when the breech block is forced rearwardly whereby the protruding end of the pin may operate to deflect an ejected shell.

10. The combination of the sliding barrel, the breech block operating in connection therewith, the extractor movably connected with the breech block, and a spring operating upon said extractor and through the same upon the breech block and operating through the breech block upon the barrel whereby the same spring may operate the extractor and also operate the breech block and also operate the barrel sliding in connection with the breech block.

11. The combination of a casing, a sliding barrel, a breech block sliding with and independently of the barrel, an extractor pivoted to the breech block and having an arm beyond said pivot and provided with an opening, a spring for actuating the breech block and bearing against said arm of the extractor, and a guide pin for said spring protruding when the spring is contracted through the opening in the extractor arm.

12. The combination of a sliding barrel, a casing having a lateral recess alongside the barrel, a latch pivoted between its ends to the barrel opposite the casing recess and having its front end spring into engagement with the front wall of said recess when the barrel is in its rearmost position, and the breech block operating when advanced upon the rear end of the latch to release its front end from such engagement, substantially as set forth.

13. The combination with the breech block and an extractor, of the breech block spring, and a guide pin for said spring protruding through the breech block when the latter is retracted whereby the said guide pin may operate to deflect or eject a shell.

14. The combination of the casing, the back plug fitted removably thereto, a breech block, an extractor carried by the breech block, a spring operating the extractor and

breech block, and a pin guiding said spring and carried by the back plug whereby it may be applied and removed therewith, said pin protruding forwardly beyond the breech block when the latter is retracted whereby it may operate to deflect an ejected shell.

15. The combination of the casing, a sliding barrel, a back plug in the casing, a breech block, an extractor pivoted to the breech block and having an arm beyond the pivot and provided with an opening, a spring operating between the breech block and the back plug and bearing at its front end against the arm of the extractor, and a guide pin extending through said spring and arranged to protrude at its front end through the opening in the extractor arm when the spring is compressed.

16. The combination of a back plug and a casing, having its rear end split or divided, forming opposite spaced apart jaws adapted to receive the back plug and to be contracted thereupon and an operating device between said jaws.

17. The combination of a casing having its rear end split or divided, forming opposite spaced apart jaws, a back plug, and a cross pin connecting said jaws and threaded in one of same, whereby the pin may be turned to contract the divided end of the casing to grip the back plug.

18. The combination of a casing, a safety lever having an undercut opening or seat for a pivot pin, and a pivot pin turning in the casing and within the undercut opening of the safety lever, whereby it may be adjusted to position to secure the safety lever or permit the application or removal thereof.

19. The combination of a casing, a safety lever having an opening or seat for a pivot pin, and a contracted slot leading therefrom, and a pivot pin turning in the casing and adapted to be turned within the opening or seat of the safety lever and when properly adjusted, to pass through the contracted slot leading thereto.

20. The combination of a casing, a safety lever, and a cross pin movable rotarily in one of said parts, the other of said parts having a seat for the pin with a relatively contracted opening leading thereto.

21. The combination of a casing having its rear end split or divided, forming opposite spaced apart jaws, a back plug fitting within the rear end of the casing, a cross pin connecting the casing jaws, and threaded into connection with one of said jaws, whereby it may be turned to tighten the jaws, and a safety lever having a seat for the cross pin with a relatively contracted opening leading thereto.

22. The combination of a casing having a sear stop, a safety lever supporting the firing mechanism, including a hammer and a sear for holding and releasing the same,

such safety lever being movably connected with the casing, whereby it may be moved to set the sear into and out of position to be stopped by the sear stop of the casing.

5 23. The combination of a casing having a sear stop, a sear, and a safety lever carrying the sear and movable whereby to set the sear into and out of position to be stopped by the sear stop.

10 24. The combination of a casing having a sear stop, a safety lever movable relatively to the casing, a sear supported in the said safety lever and having a forwardly projecting portion resting normally in rear of
15 the sear stop, whereby to be locked thereby, and adapted to be moved by the movement of the safety lever to a position above the sear stop whereby it will clear the sear stop.

25. The combination of a back plug, a casing receiving said plug and adapted to be 20 contracted thereon, and means for contracting the casing upon the back plug.

26. The combination of a casing split or divided forming spaced apart jaws, a back plug fitting within said jaws, and means for 25 contracting the jaws upon the back plug.

27. The combination of a back plug a split casing receiving and contracted upon the said plug and means for moving the 30 jaws relatively to each other.

JOSEPH JOACHIM REIFGRABER.

Witnesses:

SOLON C. KEMON,
PERRY B. TURPIN.