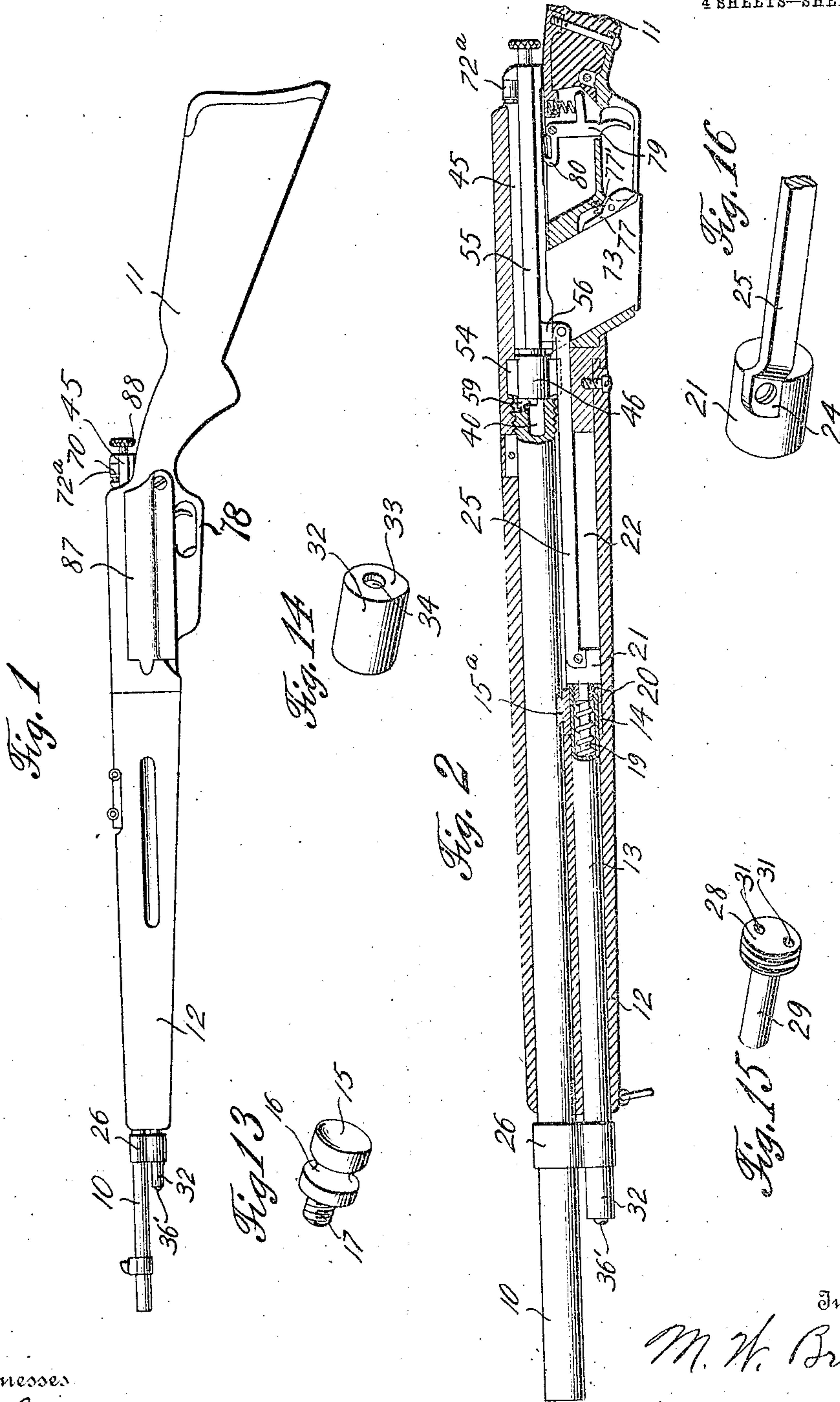


M. W. BROWN.
AUTOMATIC RIFLE.
APPLICATION FILED FEB. 8, 1910.

966,995.

Patented Aug. 9, 1910.

4 SHEETS—SHEET 1.



Witnesses

E. Larson

M. J. Taylor

By

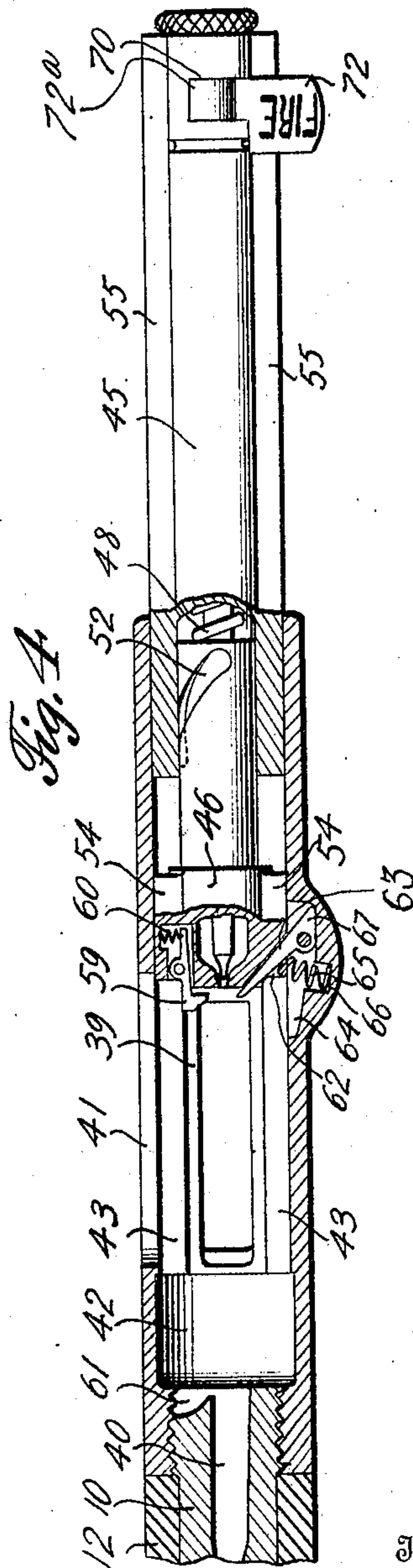
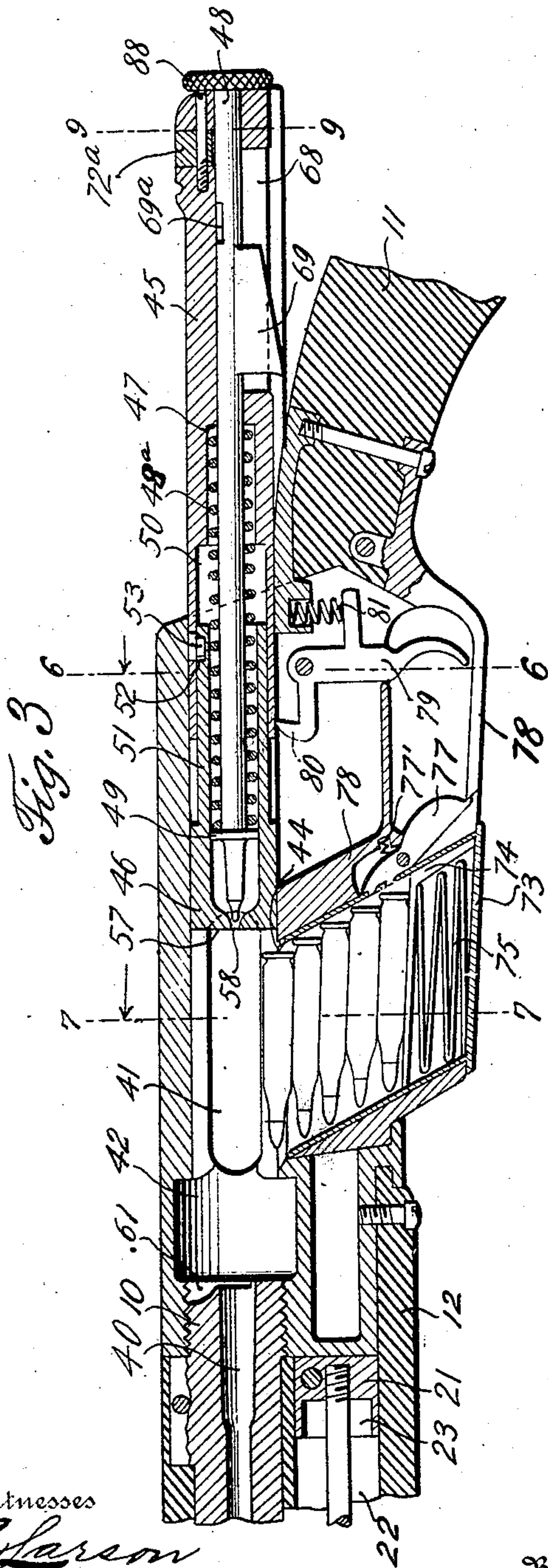
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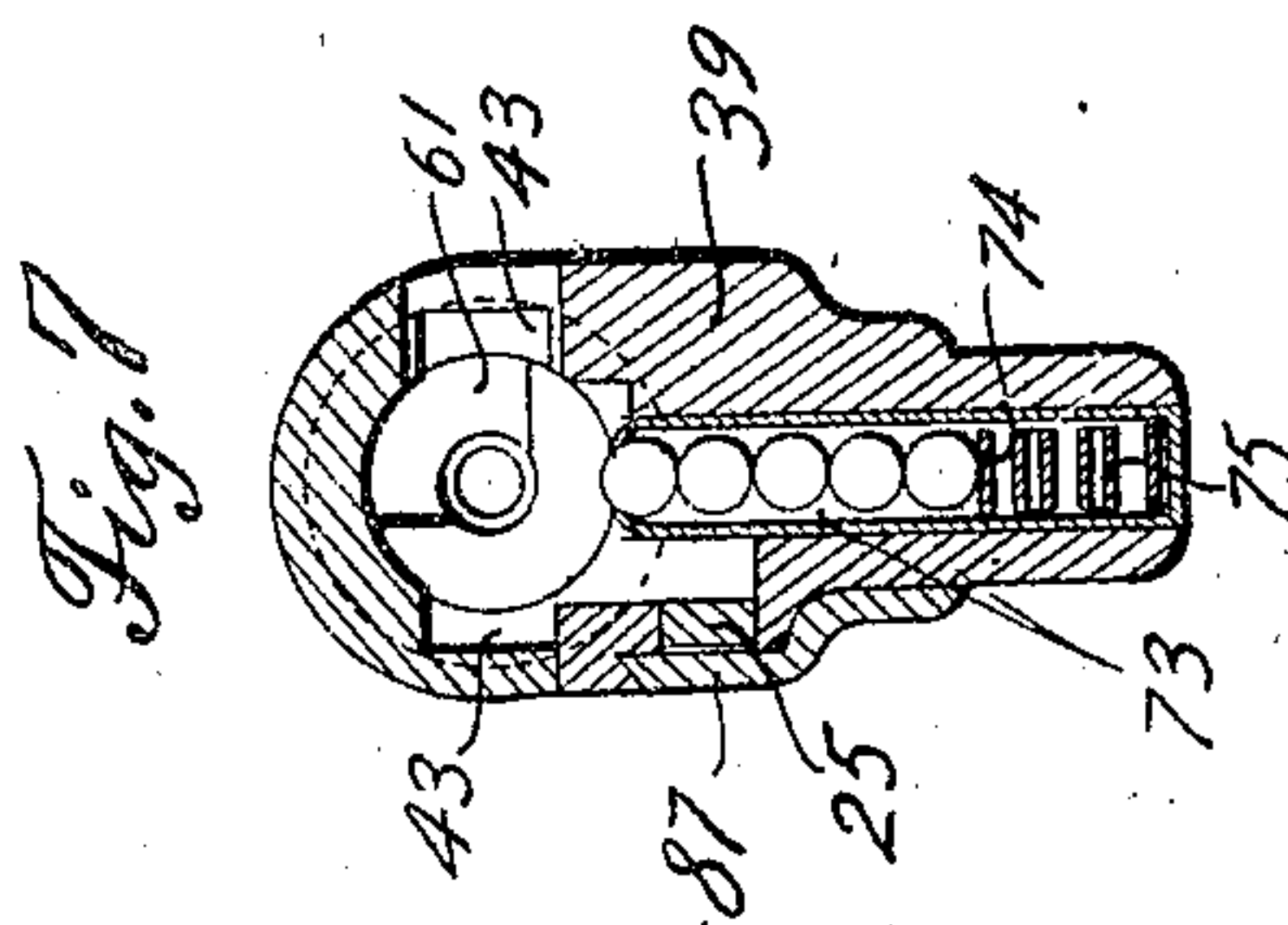
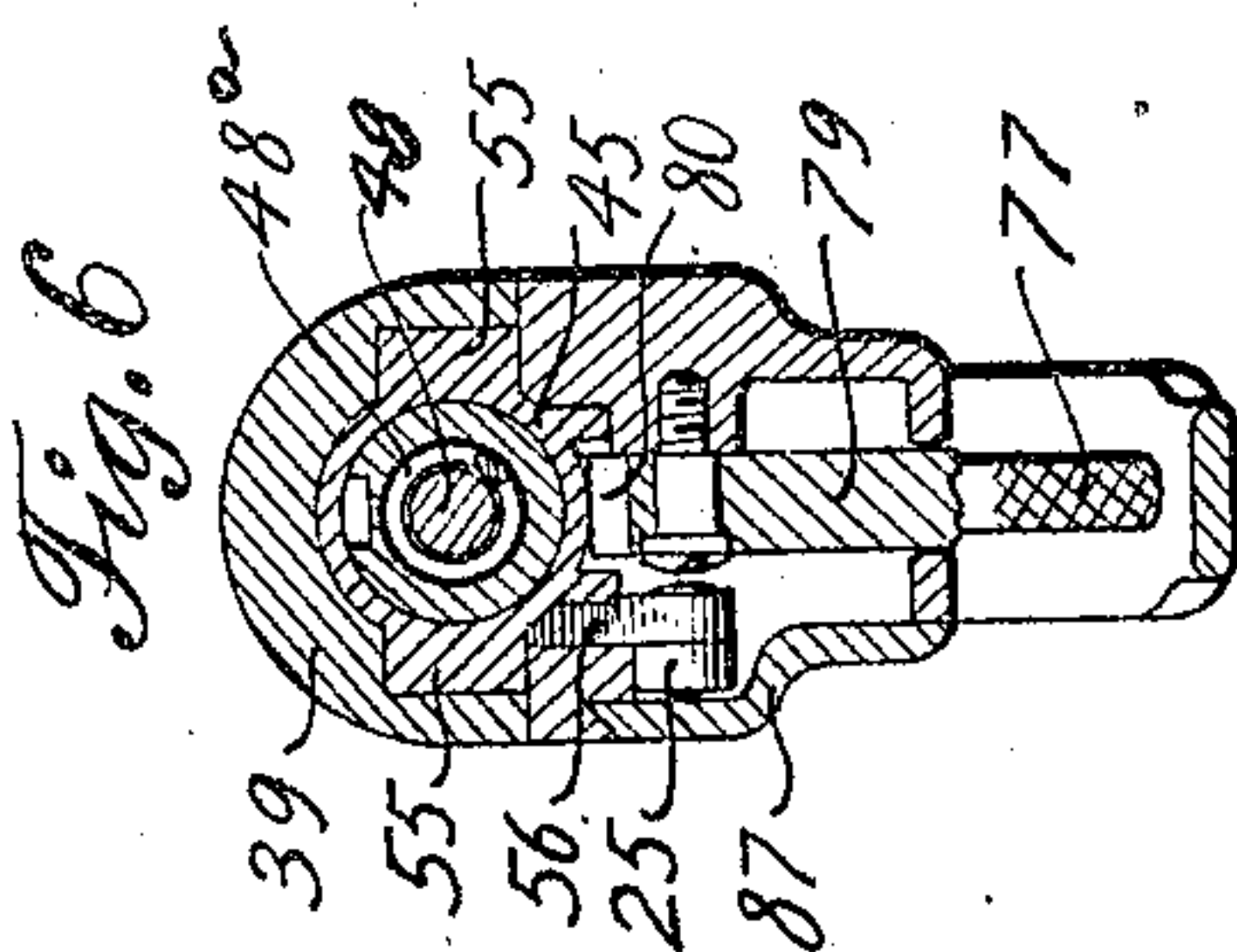
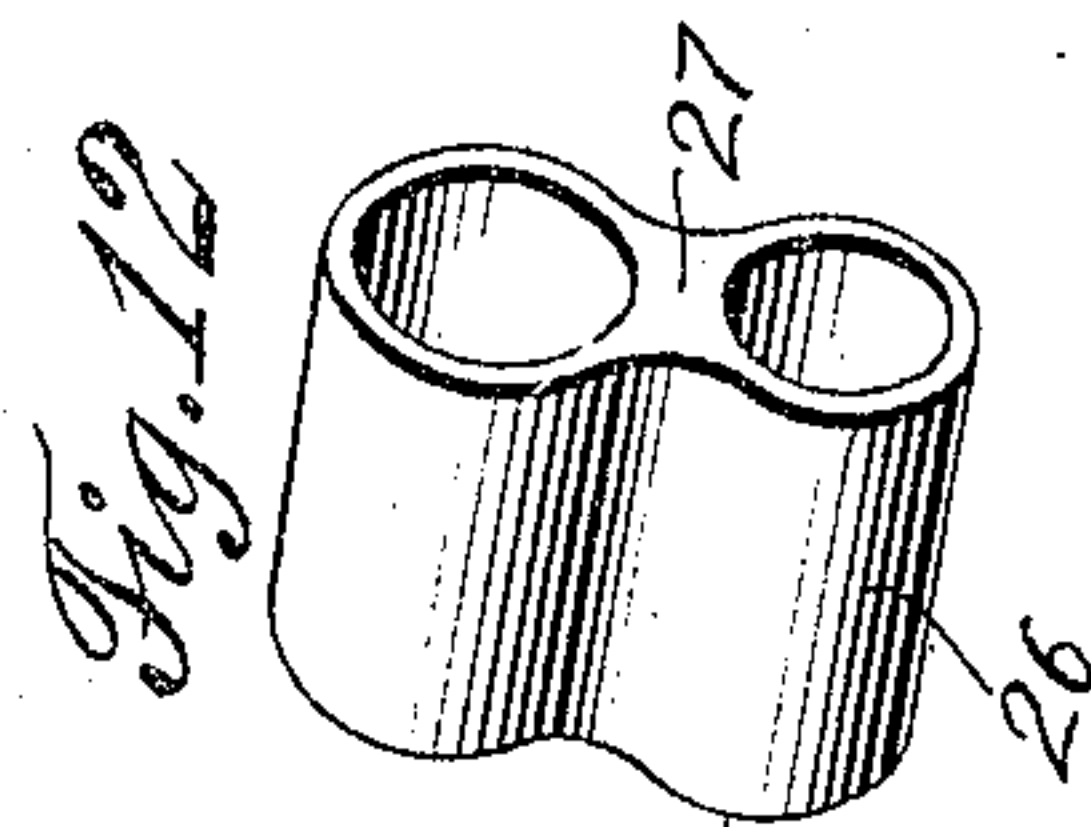
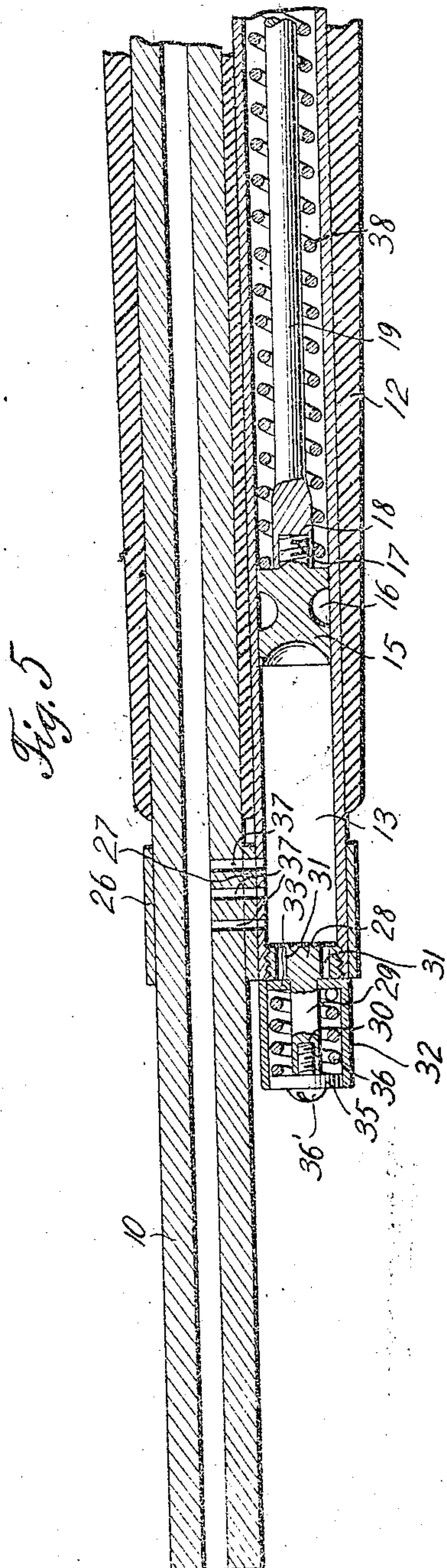
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4 SHEETS—SHEET 3.



Witnesses

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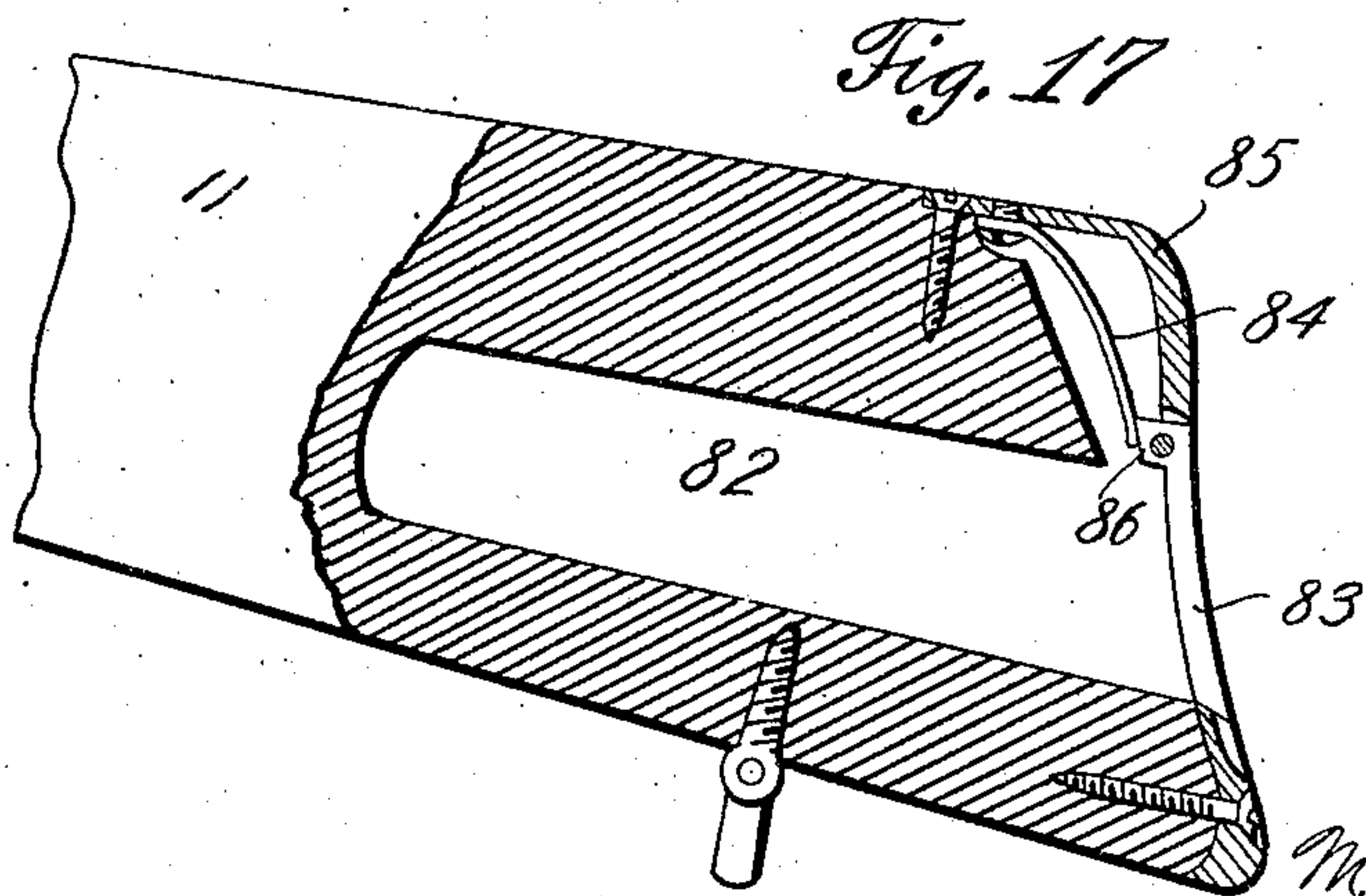
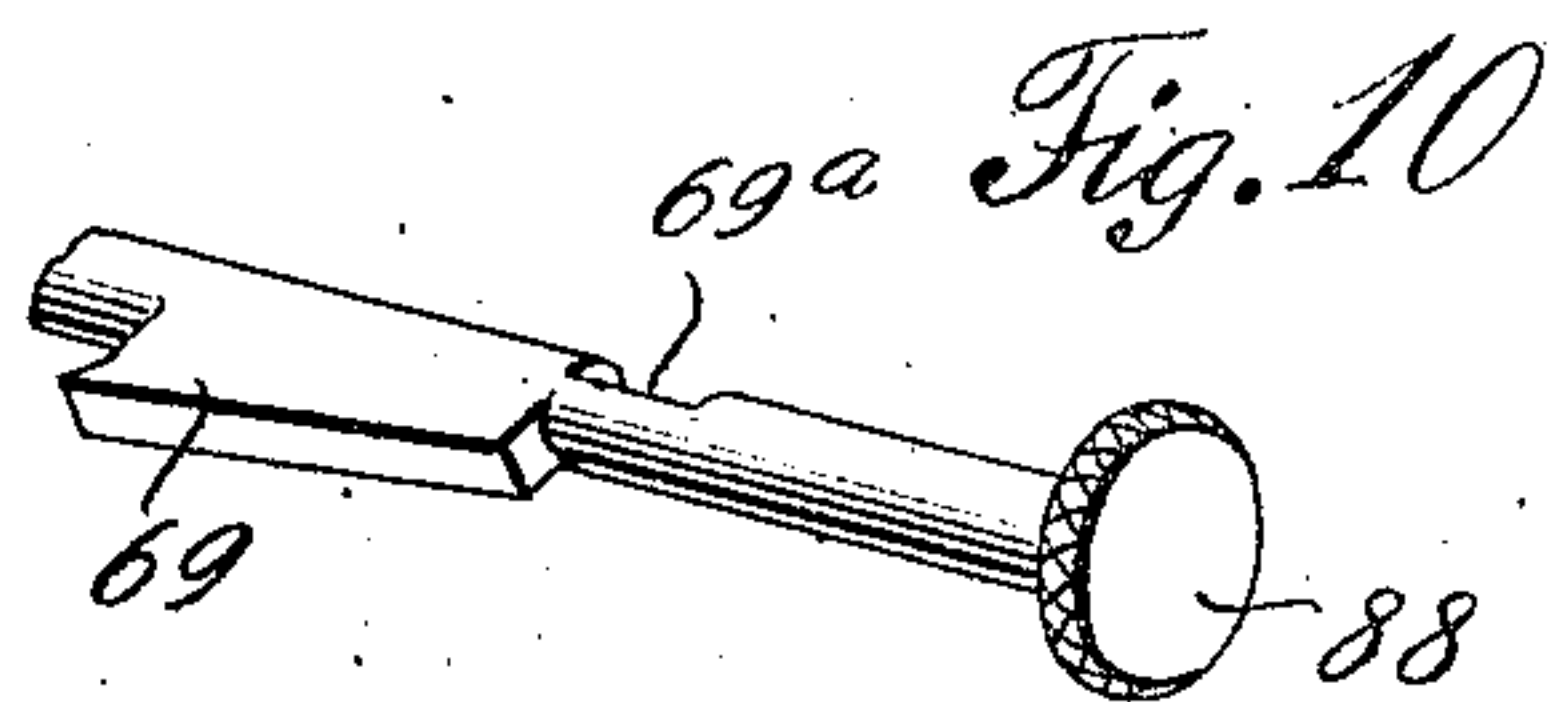
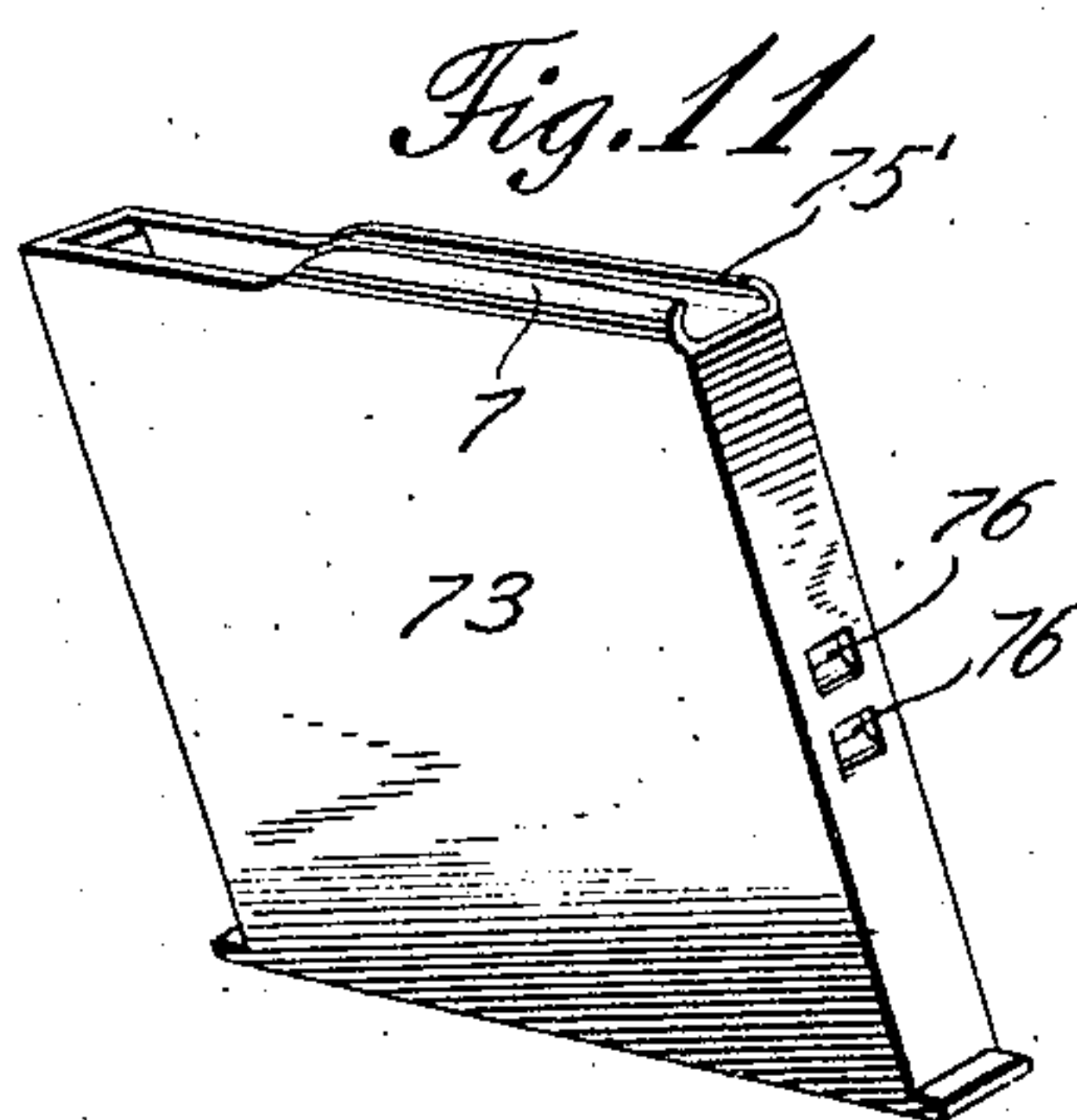
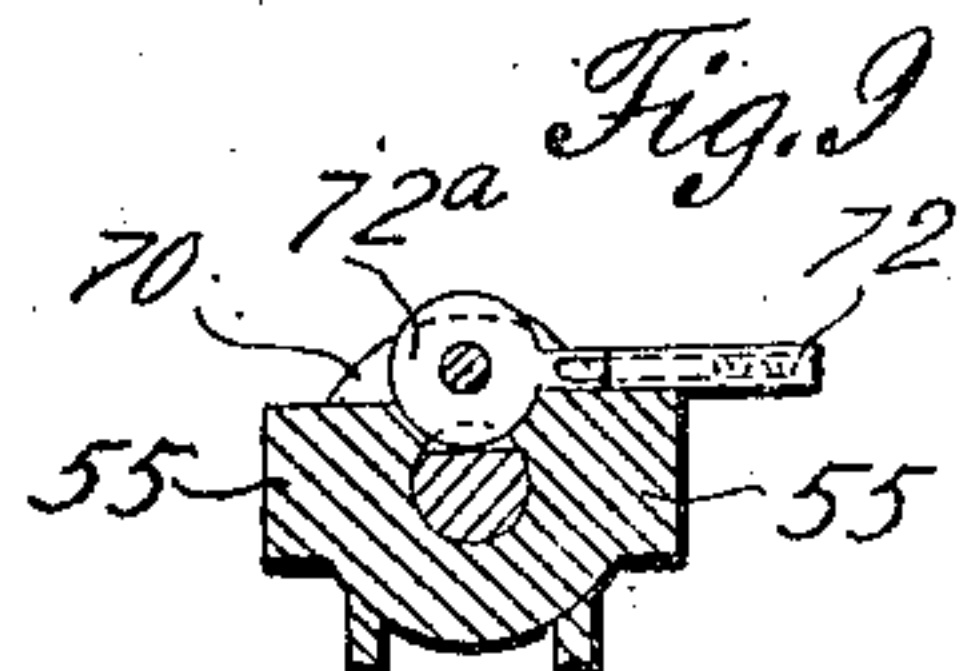
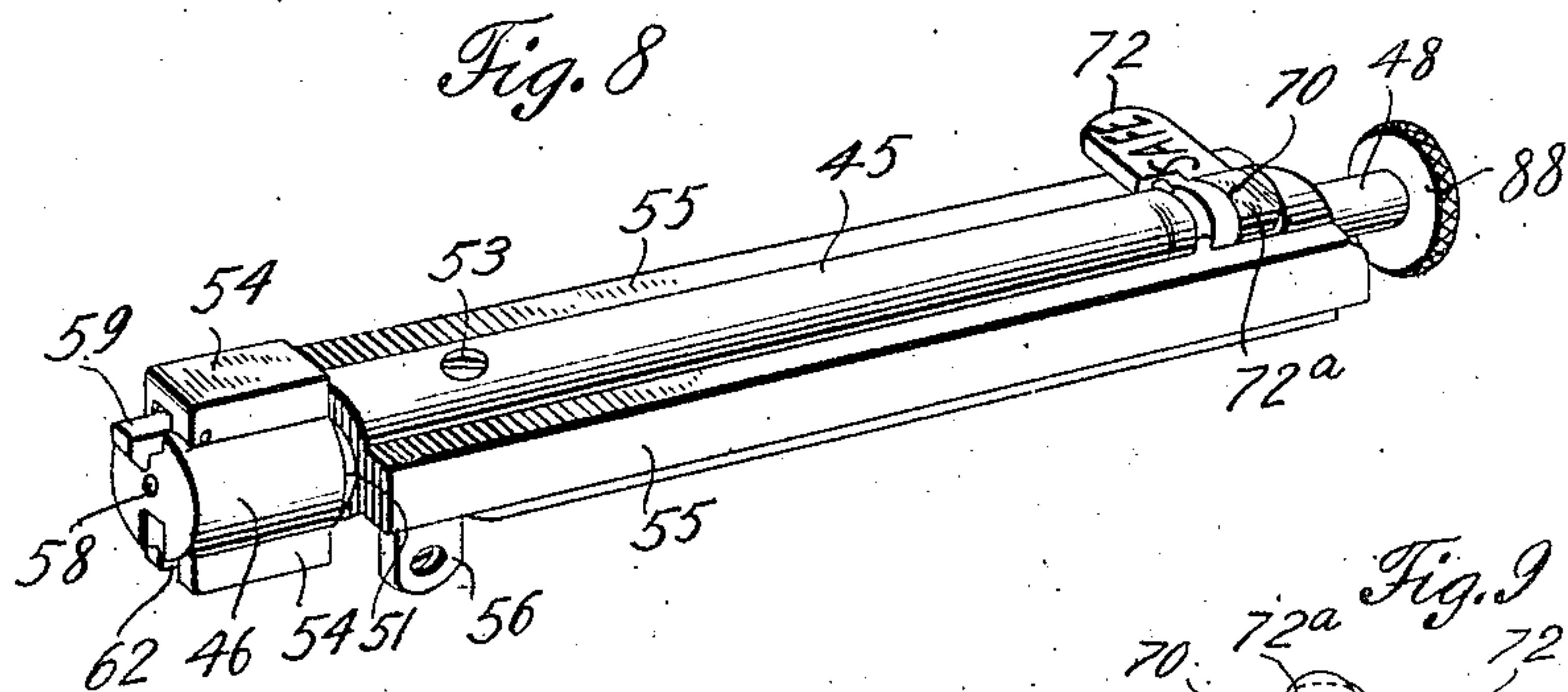
Attorneys

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4 SHEETS—SHEET 4.



Witnesses

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MILTON W. BROWN, OF TRENTON, NEW JERSEY.

AUTOMATIC RIFLE.

966,995.

Specification of Letters Patent.

Patented Aug. 9, 1910.

Application filed February 8, 1910. Serial No. 542,723.

To all whom it may concern:

Be it known that I, MILTON W. BROWN, a citizen of the United States, residing at Trenton, in the county of Mercer and State of New Jersey, have invented certain new and useful improvements in Automatic Rifles, of which the following is a specification.

This invention has reference to guns and particularly to that type of guns known as gas-operated, automatic, magazine rifles.

It is designed to construct a gun that will be provided with means whereby the breech bolt may be automatically locked previous to the firing, said breech bolt also automatically releasing itself after the cartridge has been fired.

This invention also contemplates the provision of a bolt which will have substantially the regulation bolt action in combination with the above named improvements.

A further object is the combination in one gun of compact formation of a safety lock for the firing pin, and a gas chamber for operating the breech bolt by means of the powder gases, all of which elements are simplified and improved.

With the above and other objects in view, this invention consists of the construction, combination and arrangement of parts all as hereinafter more fully described, claimed and illustrated in the accompanying drawings, wherein:

Figure 1 is a side elevation of a gun constructed in accordance with the present invention, illustrating the location of the various elements of the mechanism; Fig. 2 is a central longitudinal section of the gun, parts thereof being in elevation, illustrating the location of the gas chamber, the ejector and receiving chambers, the magazine and breech bolt; Fig. 3 is a detail longitudinal section taken through the chamber illustrating the breech bolt at the extreme limit of its rearward stroke, and setting forth the cooperation between the breech bolt and the magazine, also between the gas operated piston rod and breech bolt; Fig. 4 is a horizontal section thereof; Fig. 5 is a central longitudinal section of the cylinder in which reciprocates the gas operated piston, illustrating the connection thereof with the barrel of the gun; Fig. 6 is a cross section taken along line 6—6 of Fig. 3; Fig. 7 is a similar view taken along line 7—7 of Fig. 3; Fig. 8 is a perspective view of the breech bolt;

Fig. 9 is a transverse section of the firing pin locking means; Fig. 10 is a fragmental perspective view of the firing pin; Fig. 11 is a perspective of the magazine; Figs. 12, 13, 14, 15, and 16 are perspective views of the band securing the gas cylinder to the barrel of the gun, of the piston operating in said cylinder, of the escape valve, of the plug carried in the forward extremity of said cylinder on which the escape valve operates, and of the plunger operating the action slide, respectively; Fig. 17 is a fragmental longitudinal section of the stock of the gun.

Reference being had to the drawings, 10 indicates the barrel of the gun provided with the stock 11 and the fore arm 12, said fore arm containing the gas operated mechanisms in such a manner that the size of the former is not materially increased in comparison to the sizes of the similar elements of an ordinary magazine rifle.

Carried in the fore arm and protruding from the forward extremity thereof is the cylinder 13, said cylinder extending to within substantially six and a half inches of the breech mechanism and magazine, and is secured to the barrel at the rearward extremity thereof by the band 14 encircling the same. The band 14 is provided with the upwardly extending lug 15^a which is dove-tailed into the barrel of the gun, thus firmly and substantially securing the cylinder thereto.

A piston 15 reciprocates in the cylinder 13, and has the annular groove 16 mid-way of its length and the rearwardly projecting threaded lug 17. This lug 17 engages a threaded orifice 18 in the forward extremity of the piston rod 19 and rigidly secures said piston thereto. The rear extremity of the cylinder is closed by the central orificed plug 20 through which reciprocates the piston rod 19. The rear terminal of the piston rod is engaged by the plunger 21, said piston rod being threaded therein. This plunger reciprocates in the bore 22 of the fore arm between the extremity of the cylinder and the breech mechanism and is so constructed that the same is provided with a recess 23 which fits over the rear extremity of the cylinder when the breech bolt is at the extreme forward position of its stroke. The plunger 21 is also provided with the depression or recess 24 in one side thereof in which is secured the forward terminal of the action slide 25.

The forward extremity of the cylinder is secured to the barrel 10 of the gun by the band 26, said band passing about both the cylinder and the barrel and is centrally depressed as at 27 to provide a means for bracing the cylinder as the same is constructed in spaced relation with respect to the barrel. The cylinder ends flush with the forward edge of said band and is interiorly threaded adjacent the extremity.

An exteriorly threaded plug 23 is adapted to fit in the forward extremity of the cylinder 13, said plug being provided with the stem 29, in the forward terminal of which is the interiorly threaded bore 30. On each side of the stem 29 and extending completely through the plug 23 are the ports 31, said ports connecting the interior of the cylinder with the exterior atmosphere. A tubular valve 32 is provided with the inwardly extending flange 33 at one extremity thereof, said flange surrounding the centrally disposed opening 34 in which reciprocates the stem 29. A disk 35 is secured to the terminal of the stem by the screw 36 being received in the threaded opening 30 of said stem, said disk being of a smaller diameter than the interior diameter of the tubular valve. A spring 36 operates between the disk and the flange 33 in such a manner that the valve is normally retained against the plug 23, closing the ports 31. In order that the cylinder may be connected with the bore of the barrel 10, a series of aligned ports 37 pierce the cylinder, the depressed portion 27 of the band 26 and the lower side of the barrel 10.

From this construction it will readily be seen that after a bullet passes the ports 37, the same closes for an instant the bore of the rifle between the ports and the nozzle thereof, and during this time most of the gases of the burning powder will escape through the ports and into the cylinder 13, exerting a pressure on the piston 15, forcing the same rearwardly against the pressure of the spring 38 bearing between the plug 20 and the piston 15, normally retaining the piston in the forward end of the cylinder. This action of the piston rod will force the plunger 21 rearwardly in the bore 22 of the fore arm and as a result move the action slide 25, which will in turn operate the breech bolt. Should the pressure of the gases be above the normal in the cylinder 13, the surplus will pass through the ports 31 and exert a pressure against the flange 33 of the tubular valve member 32 sufficient to move the same from contact with the plug against the pressure of the spring, and permit the free flow of gases through said ports. This will reduce the pressure within the cylinder sufficiently to promote safety of the gun.

The breech of the rifle comprises the cham-

ber 39, said chamber being secured to the fore arm 12 at its forward extremity and the stock 11 at the opposite extremity thereof. The barrel 10 is threaded in said chamber or receiver and is provided with an enlargement 40 wherein the shell is retained previous to the firing thereof. The chamber is provided with an elongated opening 41 through which the shells are ejected after firing thereof, said opening being so located that it registers with the slots in which the breech bolt operates as hereinafter more fully described. The rear extremity of the chamber is open in order to provide for the full reciprocation of the bolt, permitting the same to pass rearwardly over the trigger in such a manner that the firing pin is withdrawn slightly in order that sufficient force may be imparted thereto to explode the cartridge.

At the forward extremity of the chamber and adjacent the enlarged portion 40 is a circular recess 42, the diameter of which is larger than the bore of the chamber, and consequently provides a means whereby the bolt may be locked, securely clamping the shell within the enlarged portion 40 of the bore of the rifle.

The chamber or receiver is provided in the vertical sides thereof with the longitudinally extending guide-ways 43, said guide ways or slots coinciding with the largest diameter of the recess 42, and further provide a means whereby the bolt is securely held within the chamber or receiver and the longitudinal movement thereof be accurate. An opening 44 is formed in the under side of the chamber or receiver 39 in such a manner that the cartridges contained in the magazine may be taken therefrom and placed within the chamber 40 by the bolt upon the forward movement thereof.

The breech bolt is formed in two portions, the main body portion 45 and the forward locking member 46. The main body portion is provided with a longitudinal bore 47 in which operates the firing pin 48. The forward terminal of the bore 47 is enlarged to provide a housing for the spring 48^a which bears against the collar 49 formed integrally about the forward extremity of the firing pin and the shoulder of the enlarged portion, and consequently, is adapted to project the pin from the bolt. A further enlargement 50 is provided in the forward extremity of the main body portion 45 of the bolt in which reciprocates the shank 51 of the locking portion 46 of the bolt. This shank is provided with the spiral groove 52 which is normally engaged by the pin 53 carried by the main body portion and which is flush with the surface thereof. Thus it will be seen that when the bolt is forced rearwardly the pin 53 will travel in the spiral groove 52 and cause the locking por-

tion 46 to rotate and when the bolt is forced forwardly the locking portion will rotate oppositely.

The locking member 46 is provided with the oppositely disposed lugs 54, said lugs being the locking means of the bolt. The lugs 54 are of the same diameter as the enlarged recess 42 and are so constructed that upon the rearward movement of the bolt the forward portion 46 thereof rotates, bringing the lugs to such a position that they will pass into the guide ways 43 of the receiver. As a result, free movement of the bolt is permitted. Upon the forward movement of the bolt the lugs pass into the chamber 42 and are rotated by the spiral groove 52 and the pin 53, consequently locking the bolt against the chamber 40 and clamping the cartridge which is placed therein thereby firmly in position.

The main body portion 45 of the bolt is provided with the oppositely disposed projections 55 which operate in the slots 43, forming guides for the bolt. In order to provide a means whereby the action slide 25 is secured to the main body portion of the bolt in order that the same may be reciprocated, a downwardly projecting lug 56 is carried at the forward extremity of said body portion 45, to which is attached in any suitable manner the action slide 25. The rotatable locking portion 46 is provided with an inwardly extending flange 57 which surrounds a central opening 58, through which operates the firing pin 48. One of the lugs 54 has pivotally mounted therein the extractor 59, said extractor being retained in contact with the bead of the cartridge by the spring 60 operating against the rear extremity thereof. The forward extremity of the extractor is of latch formation and is adapted to normally operate in the recess 61 formed in the forward extremity of the receiver and adjacent the chamber 40. Upon the forward motion of the bolt it will readily be seen that the shell is jammed tightly into the chamber 40 and the bead of which bears against the extractor. Thus it will be seen upon the rotation of the locking portion of the bolt through its quadrant, the shell will be slightly loosened in the chamber due to the tendency of the locking portion to move rearwardly, thereby facilitating the removal of the shell. The opposite lug 54 is provided with the longitudinal recess 62 which coincides, when the bolt is at the extreme portion of its stroke, with the ejector 63. This ejector operates normally in the recess 64 in the side of the receiver 39 and is pressed inwardly by the coil spring 65 bearing against the forward extremity of the ejector and in the recess 66. This ejector is adapted when extending into the bore of the receiver to bear against the extreme left hand side of the base of the

shell, and consequently exert a pressure thereagainst and swing the forward extremity of the shell through the opening 41 in one side of the receiver, thus ejecting the same. The rear extremity of the ejector comprises a lug 67 adapted to rest flush with the base of the recess 64 and prevent the ejector from extending too far into the bore of the receiver. The forward movement of the bolt returns the ejector to the recess 64 in such a manner that the same rests flush with the surface of the guide-ways 43, and in no way interferes with the movement of the bolt.

The under surface of the rear extremity of the bolt is provided with an elongated recess 68 in which reciprocates the downwardly extending projection 69 which is carried by the firing pin 48, said projection adapted to be engaged by the trigger as hereinafter more fully described, upon the forward movement of the bolt and consequently retain the forward extremity of the firing pin a short distance from the cap of the cartridge. From this construction, upon pulling the trigger, the firing pin will be released and will explode the cap, as a result, firing the bullet.

In order that the firing pin may be locked when the same is cocked and prevent the firing of the gun accidentally, a recess 69^a is formed adjacent the rear extremity thereof. When the firing pin is cocked, this recess coincides with the semi-circular opening 70 in the main body portion of the bolt, and is adapted to be engaged by a locking member. This locking member comprises a leaf 72 which is carried by and operates a circular pivoted member 72^a, one side of which is flattened. When the leaf is to the right hand side of the bolt, the rounded side of the circular member 72 engages a recess 69^a, and consequently locks the firing pin from reciprocation. However, when the leaf is placed on the other side of the bolt the flat portion operates adjacent the recess 69^a and permits free movement of said firing pin.

The magazine 73 is a parallelogram and is provided with the follower 74, said follower being operated by the spring 75. The upper extremity of the magazine is provided with the lips 75' adjacent one side thereof, said lips adapted to engage the shell of the cartridge. The lips 75' and the opening in the upper side of the magazine cooperate with the opening 44 of the receiver, the uppermost cartridge lying in the path of the bolt and adapted to be carried thereby to the chamber 40. The rear vertical side of the magazine is provided with the recess 76, said recess being adapted to be engaged by the notches formed on the forward extremity of the lever catch 77 operating in the trigger guard 78. The trigger 79 is of the usual construction, the catch 80 being held

directly in the path of the projection 69 by the coil spring 61. The stock of the rifle is provided with an opening 82 in which is contained a complete cleaning outfit, said opening 82 being provided with a closure 83 operated by the leaf spring 84 carried by the plate 85 forming the base of the stock and bearing against the lug 86 adjacent the pivotal point of said closure. One side of the receiver is provided with a detachable plate 87 which, when removed, gives complete access to the bolt and the chamber, permitting the thorough cleaning thereof and the removal of old parts and the replacing thereof by new.

From the foregoing it will readily be seen that upon the operation of the gases in the cylinder, the plunger 21 will be forced rearwardly, consequently imparting a similar motion to the bolt through the instrumentality of the action slide 25. As heretofore described the rearward motion of the bolt will cause the locking member 46 thereof to rotate within the recess 42 until the lugs 54 coincide with the longitudinally extending slots 43, after which the bolt will operate freely. When the spring carried in the cylinder returns the plunger 21 to its normal position, the bolt is likewise carried forwardly, the front extremity thereof engaging the butt of the cartridge and forcing the same by the incline surface adjacent the magazine into the chamber 40 after which the spiral groove 52 in combination with the pin 53 rotates the lugs from registering with the slots 43 in such a manner that the same bear against the shoulder of the recess 42. By the forward movement of the bolt the projection 69 is engaged by the catch 80 of the trigger and is consequently retained within the locking member 46. When the trigger is released the firing pin explodes the cap causing the bullet to be discharged and the gases to act as heretofore described, the operation being repeated upon each discharge of the gun. In order to fire the first shot, the bolt is withdrawn from the cham-

ber by hand, a pull being exerted against the disk 88 formed on the rear extremity of the firing pin, causing the operation of the bolt to be similar to the operation thereof when the same is forced rearwardly by the gases.

Having thus fully described my invention, what is claimed as new is;

1. In an automatic gas operated rifle having horizontal and longitudinal grooves formed in the breech thereof, a bolt adapted to reciprocate in said grooves comprising in combination, a main body portion having a central longitudinal bore, the forward extremity of said bore having a double enlargement, a firing pin adapted to reciprocate in said bore, a rotatable member carried in the forward portion of said double enlargement comprising a shank having spiral grooves formed therein, pins carried by said body portion adapted to engage said grooves, wings formed on said bolt adapted to operate in the grooves in the breech, and means whereby said bolt may be automatically gas operated.

2. In a gas operated automatic rifle having grooves formed in the breech thereof, said grooves opening into a circular enlargement, an ejector pivoted in said breech in the base of one of said grooves adapted to operate against one side of the base of the shell, a bolt adapted to reciprocate in said grooves carrying a rotatable portion at its forward extremity, said rotatable portion being provided with wings adapted to engage said grooves, one of said wings having a channel therein adapted to permit the ejector to project into the path of the shell after the passage of the bolt, and an extractor carried by the oppositely disposed wing adapted to loosen the shell previous to the rear movement of the bolt.

In testimony whereof I affix my signature in presence of two witnesses.

MILTON W. BROWN.

Witnesses:

ANNA ROBINSON,
WILLIAM E. BLACKMAN.