J. M. BROWNING.

FIREARM.

APPLICATION FILED NOV. 19, 1912.

1,083,384.

Patented Jan. 6, 1914.

3 SHEETS—SHEET 1.

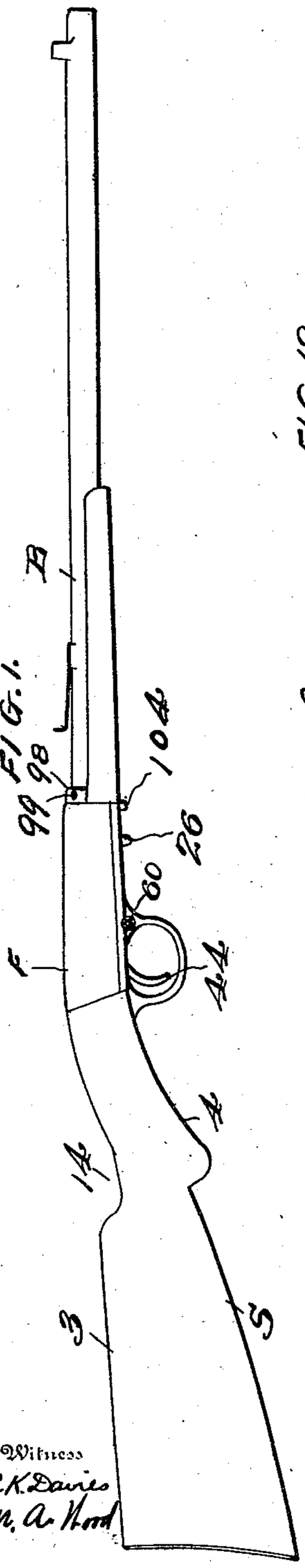

FIG. 1.

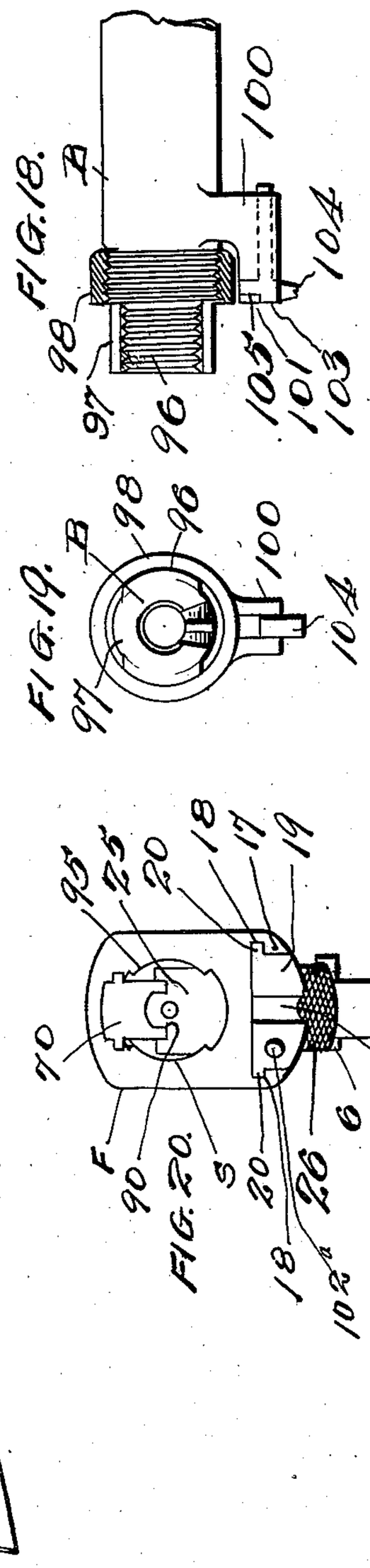

FIG. 18.

FIG. 19.

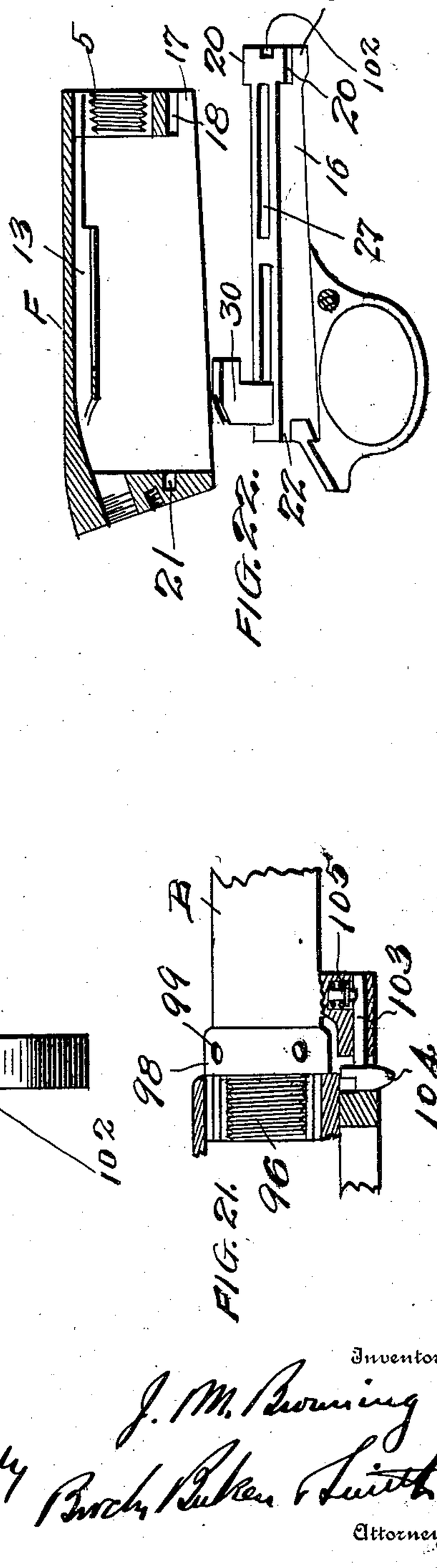

FIG. 22.

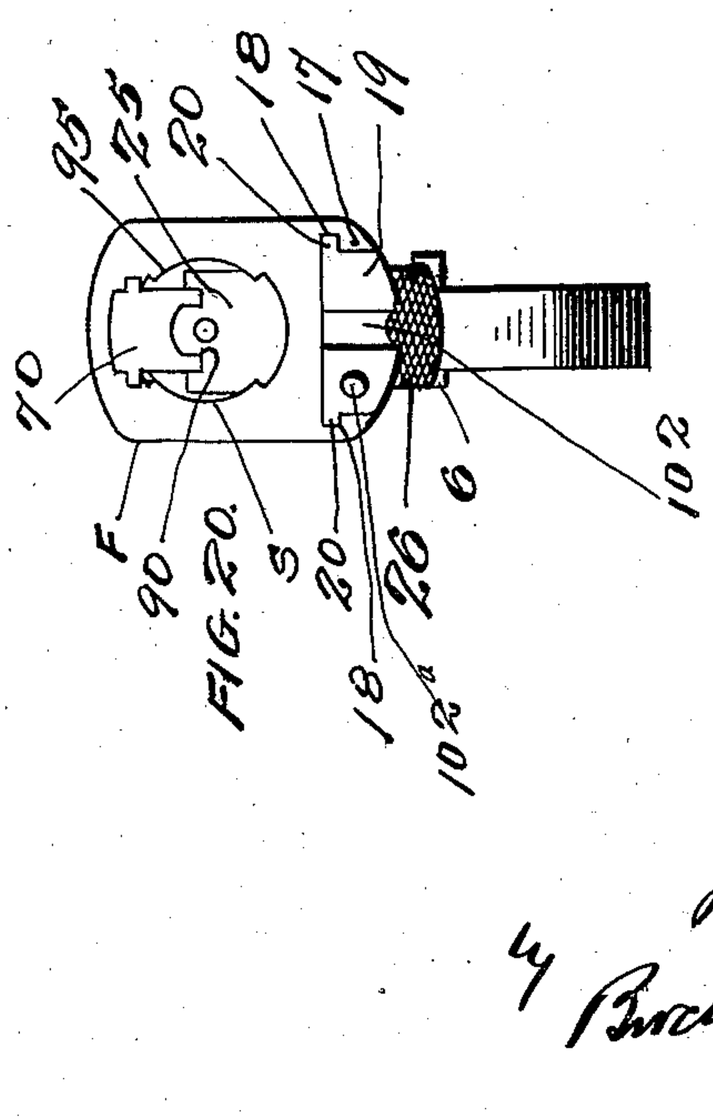

FIG. 20.

FIG. 21.

Witness
C. K. Davies
M. A. Hood

Inventor
J. M. Browning
by Birch Bakewell & Smith
Attorney

J. M. BROWNING.

FIREARM.

APPLICATION FILED NOV. 19, 1912.

1,083,384.

Patented Jan. 6, 1914.

3 SHEETS—SHEET 2.

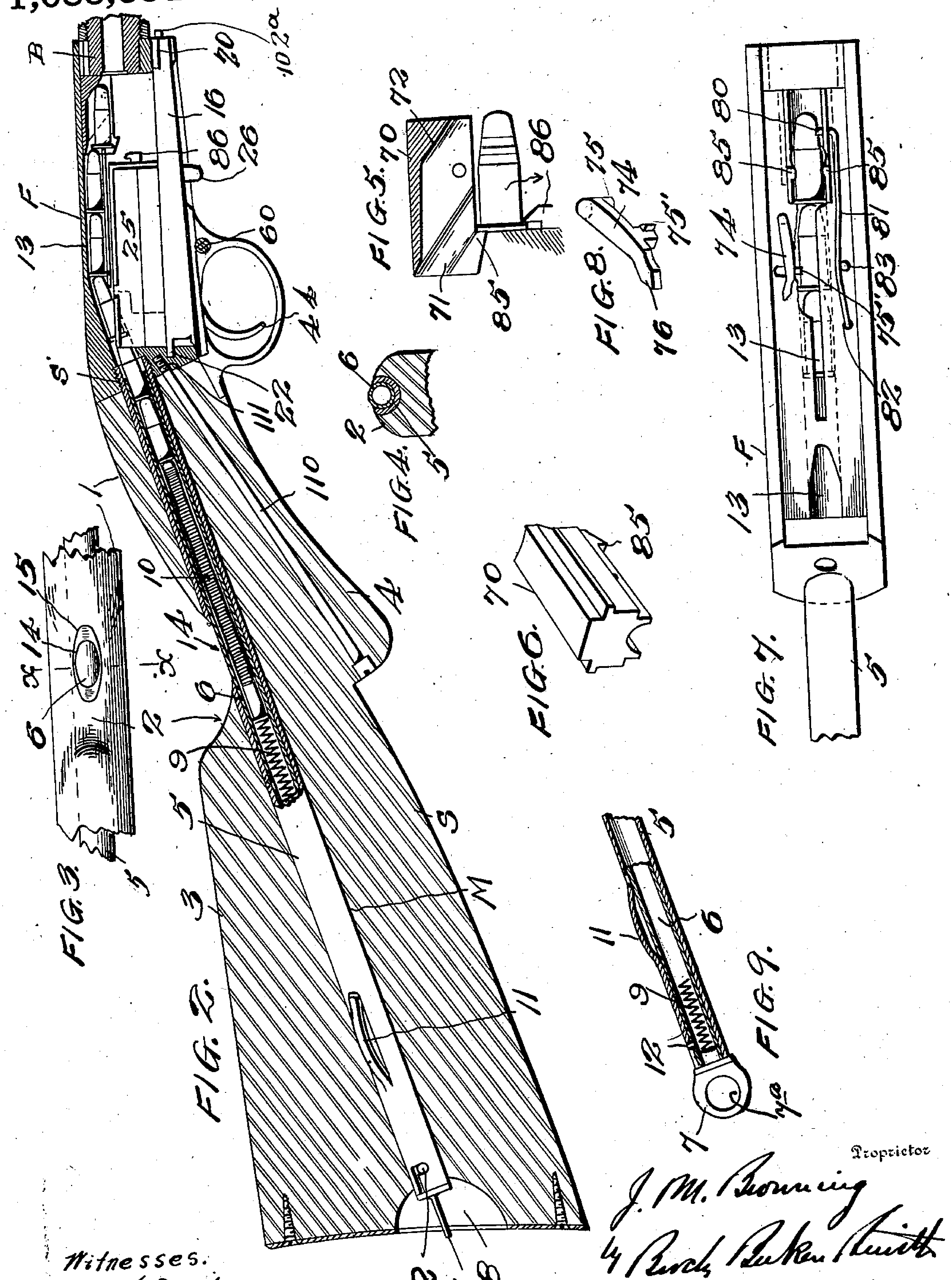
FIG. 2. FIG. 3. FIG. 4. FIG. 5. FIG. 6. FIG. 7. FIG. 8. FIG. 9.

Proprietor

J. M. Browning

by Birch Parker Smith

Attorney

Witnesses.

C. K. Davies

M. A. Wood

J. M. BROWNING.

FIREARM.

APPLICATION FILED NOV. 19, 1912.

1,083,384.

Patented Jan. 6, 1914.

3 SHEETS—SHEET 3.

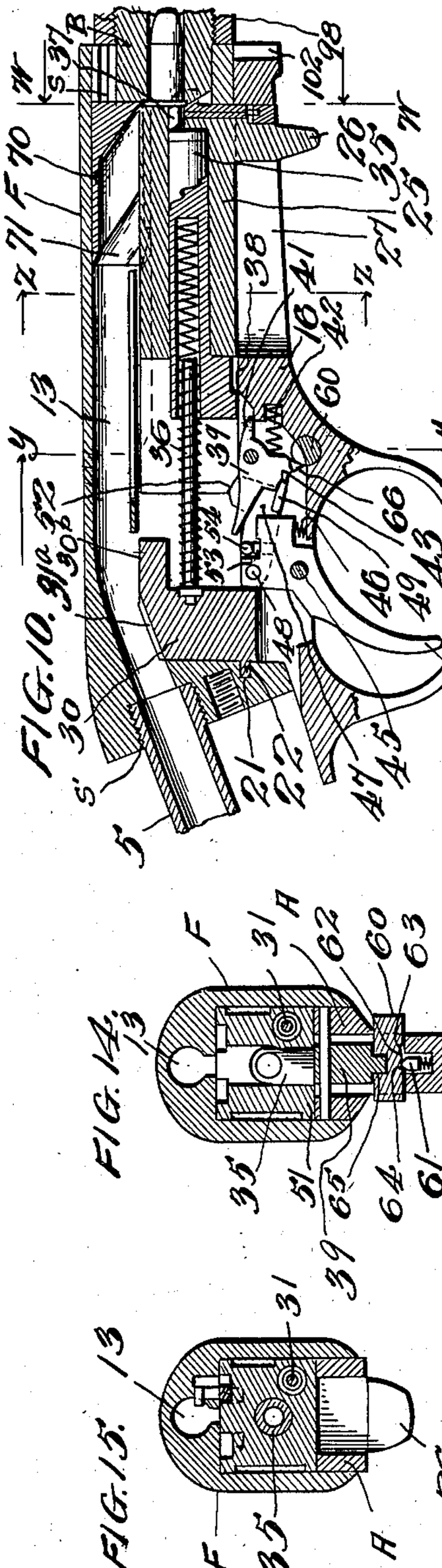

FIG. 10.

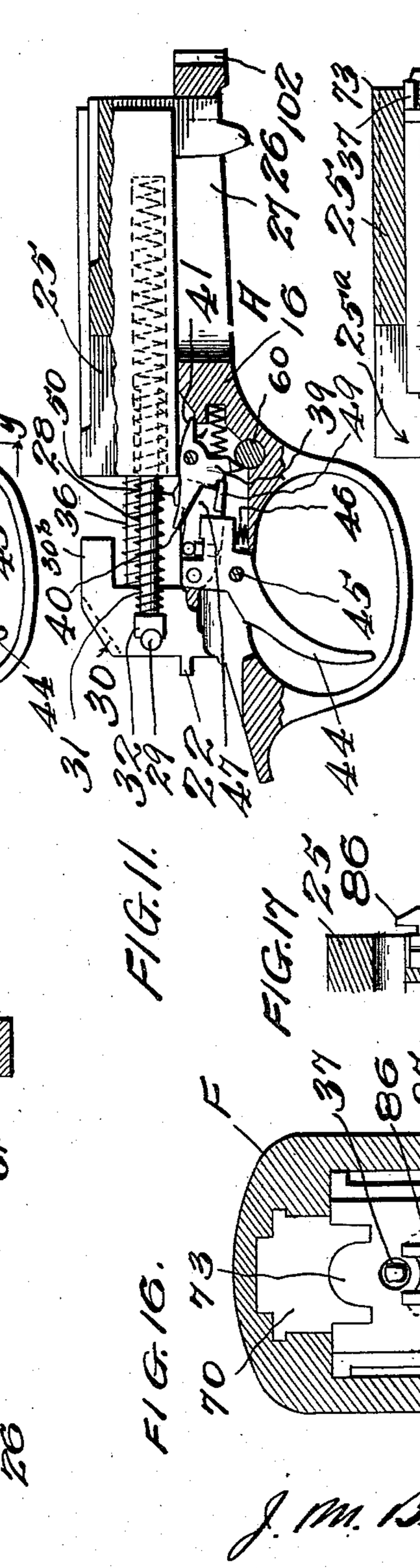

FIG. 11.

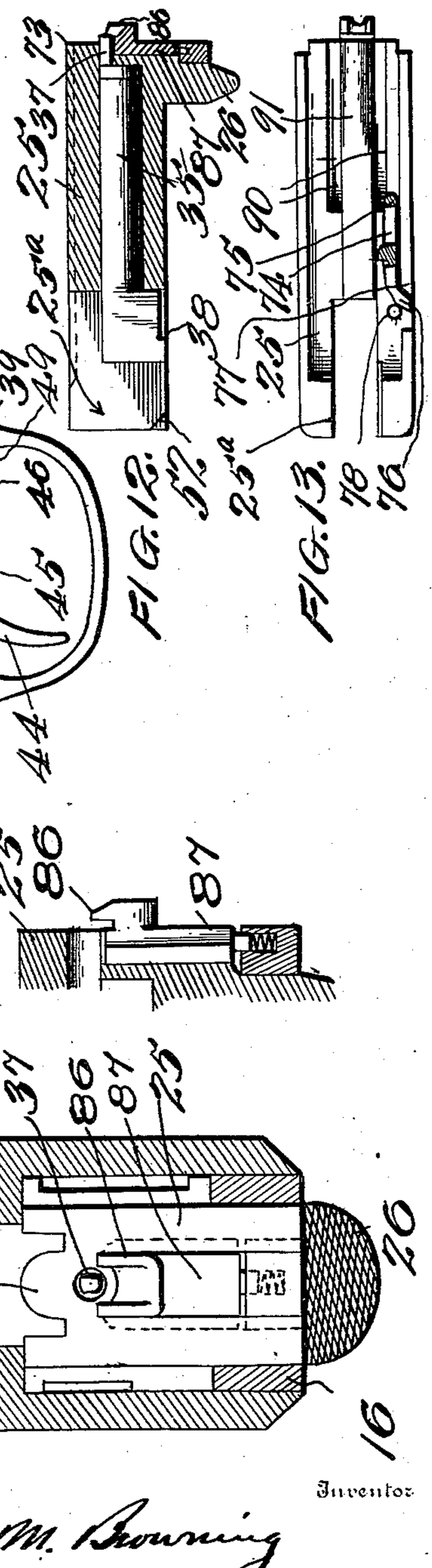

FIG. 12.

FIG. 13.

FIG. 14.

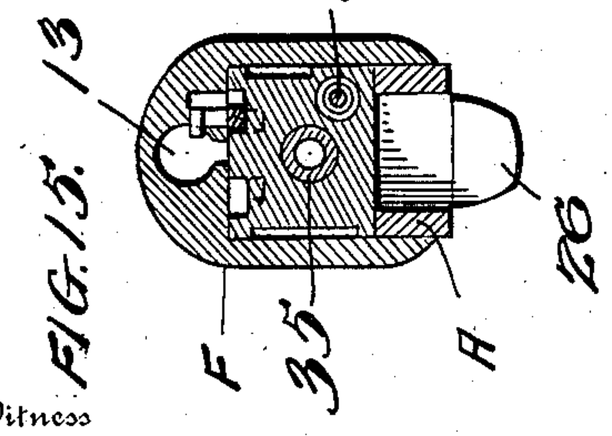

FIG. 15.

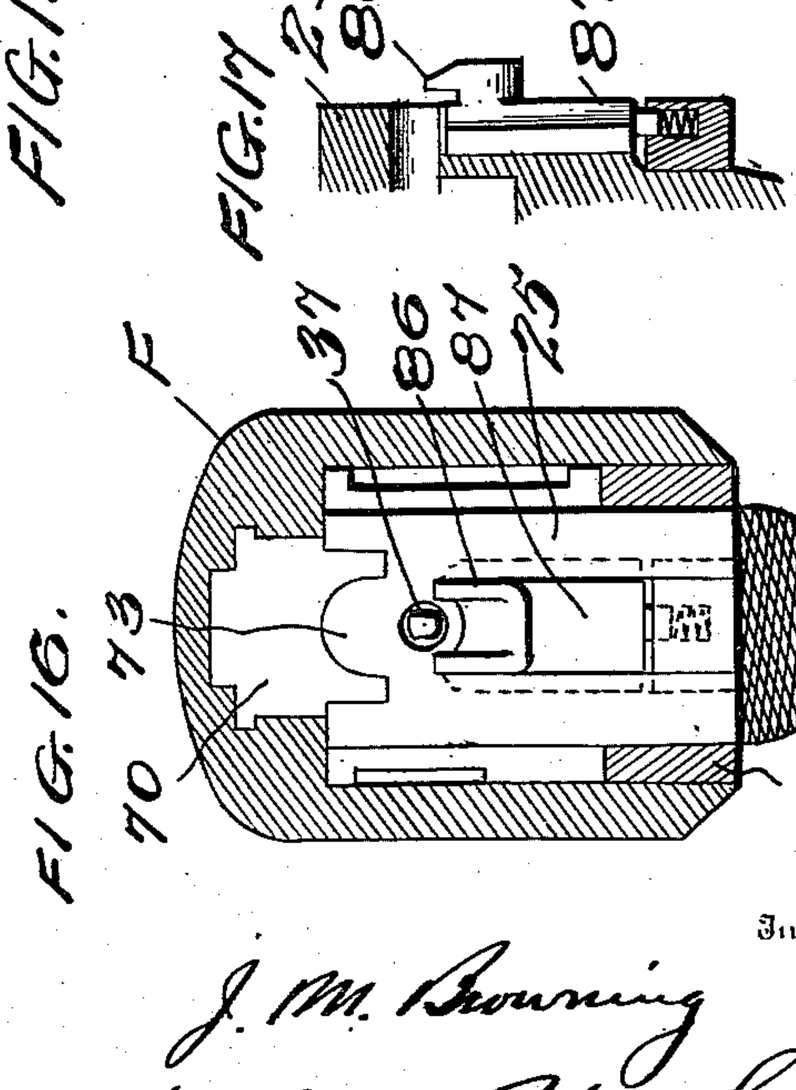

FIG. 17.

FIG. 16.

Witness

C. F. Davies

M. A. Hood.

Inventor

J. M. Browning

by Bach Baker Smith

Attorney

UNITED STATES PATENT OFFICE.

JOHN M. BROWNING, OF OGDEN, UTAH.

FIREARM.

1,083,384. Specification of Letters Patent. Patented Jan. 6, 1914.

Application filed November 19, 1912. Serial No. 732,215.

To all whom it may concern:

Be it known that I, JOHN M. BROWNING, a citizen of the United States, resident of Ogden, Utah, have invented certain new and useful Improvements in Firearms, of which the following is a specification.

My invention relates to improvements in firearms particularly adapted to automatic guns, although I do not limit myself to any particular class of weapon with respect to such features of the invention as are capable of general application. The mechanism is also particularly adapted to the use of rim fire cartridges, although by suitable modifications other kinds of cartridges may be used.

The principal object of my invention is to simplify and improve the construction of guns of this class and to arrange the parts so that the user is protected from gases and flying particles while firing.

Other characteristics and advantages of the invention will be pointed out, so far as is necessary, in connection with a detailed description of the accompanying drawings, which illustrate one embodiment of the invention.

It is to be understood that the invention is capable of embodiment in many different forms.

Figure 1, is a side elevation of a complete gun; Fig. 2, is an enlarged longitudinal section through the butt-stock and frame or receiver; Fig. 3, is a fragmentary plan showing the part of the stock adjacent to the grip and the filling opening. Fig. 4, is a transverse section on the line *x*—*x* of Fig. 3; Fig. 5, is an enlarged longitudinal section of the cartridge-guide and extractor; Fig. 6, is a perspective view of the guide, looking from the front and top; Fig. 7, is a large bottom plan of the frame with the action removed, showing the cartridge-channel, guide, stop and support with cartridges in position; Fig. 8, is a perspective view of the cartridge-stop; Fig. 9, is a sectional detail of the rear end of the magazine and follower-tube; Fig. 10, is an enlarged longitudinal section of the frame and action; Fig. 11, is a side elevation of the trigger-plate and breech-block and related parts partly broken away; Fig. 12, is a section through the breech-block, showing the firing pin in full; Fig. 13, is a top plan of the breech-block with the cartridge-stop taken out of its normal position in the frame and laid upon the breech-block in proper operative relationship thereto; Fig. 14, is a section on the line *y*—*y* of Fig. 10; Fig. 15, is a section on the line *z*—*z* of Fig. 10; Fig. 16, is a section much enlarged on the line *w*—*w* of Fig. 10; Fig. 17, is a longitudinal sectional detail of the front end of the breech-block and extractor in the scale of Fig. 16; Fig. 18, is an enlarged side view of the rear end of the barrel, the adjusting nut being shown in section; Fig. 19, is a rear end elevation of Fig. 18; Fig. 20, is a front view of the frame with the barrel removed; Fig. 21, is a fragmentary section of the front end of the frame and barrel fastening, the barrel being shown in position. Fig. 22, shows the empty frame in longitudinal section and the trigger-plate in perspective below the frame, this view being designed to show particularly the complemental engaging members of the frame and trigger-plate.

Considering the gun as composed of different groups of parts, reference character F designates the frame or receiver; A the action or working parts therein; B the barrel detachably secured to the front end of the frame; S the butt-stock secured to the rear end of the frame, and M the magazine in the butt-stock. The frame houses the action, and all parts of the mechanism are designed so that the frame may present an absolutely solid and unapertured exterior, except for the ejecting opening 27 in the bottom, the threaded socket in the front end to receive the barrel, and threaded socket *s'* in the rear end to receive the magazine. When desired, and it is usually desirable, the frame may be a single piece of metal of ample strength to resist any interior explosions, and its solid top, sides and back completely protect the user of the gun from explosion gases or flying particles which might otherwise strike his face. The butt-stock is of the almost universal type, comprising a downwardly curved grip 1, forming a depression 2 forward of the comb 3. A pistol grip 4 is also preferably provided, although this may be dispensed with in certain cases.

Advantage is taken of the natural and usual form of butt-stock to provide a novel and advantageous filling opening for the magazine. The magazine comprises an outer tube 5 fixed in a longitudinal bore in the stock. The front end of the tube is screwed into socket *s'* in the frame. Within the outer tube is an inner tube 6 having at

its rear a finger-piece 7 contained in a recess 8 in the butt-stock and containing a spring 9 and a flexible follower 10. Finger-piece 7 is provided with a hole 7^a through which it is easy to insert the point of a screw-driver or other tool for the purpose of withdrawing the inner tube if it becomes jammed in any way so that it is not easily removed with the fingers. The outer tube is conveniently provided with a spring 11 engaging the inner tube to prevent it from accidentally dropping out. A bayonet or other locking device 12 is also provided at the base of the outer and inner tubes to positively secure the latter in position. Tube 5 is placed in the stock so that it forms as small an angle as possible with the upper axis of the cartridge-channel 13 located in the top of the frame. The magazine is also arranged so that it intersects the depression 2 formed in the stock close to the base of the grip 1, and at that point the outer tube 5 is exposed and is provided with a filling hole 14. This hole is normally closed by the inner tube, as shown in Fig. 2, so that there is normally a complete closure of the magazine at the filling point. The wood of the stock is rounded off to form a finishing outline 15 about the metal magazine adjacent to the filling hole, and the tube 5 is itself smoothed or beveled off, as shown in Figs. 3 and 4, to meet the inner tube so that the contour of the grip at this point is perfectly smooth and trim. The magazine is filled by pulling back the inner tube until the front end of the follower is back of the filling hole. The muzzle of the gun being held downward, cartridges are then dropped into the filling hole, bullet first, until the magazine is full. Then the inner tube is pushed in, compressing the spring behind the column of cartridge, and the inner tube is then locked by bayonet fastening 12. The act of pushing in the inner tube also closes the filling hole. This construction provides a very accessible top filling opening over the longitudinal axis of the gun, so that it is convenient equally to right-handed or left-handed users. The hole is also made in and lined with metal; it is immediately accessible without removing any outside cover-plate, and the arrangement obviates the necessity of cutting away the wood of the stock to gain access to the filling hole proper. Short cartridges can be easily inserted in this filling hole, and if one is accidentally jammed or wedged in wrong position, it can be easily reached to remove it, because of the outside and accessible arrangement of the hole. If desired, the magazine may run somewhat below the surface of the stock near the base of the grip, but in this case the natural form of the stock will bring the magazine near the surface of the wood and the wood need be cut away only slightly to give access to the filling opening. The opening will then have the same relative position in the stock as above described and is still convenient for short cartridges.

The frame, as above stated, is open at the bottom, and in this opening the trigger-plate 16 is inserted. At the front end, the lower part of the frame-wall is provided with an opening 17 having lateral channels 18. The front end 19 of the trigger-plate closes the opening 17 and the plate is provided with short flanges 20 engaging channels 18. In the rear wall of the frame is a socket 21, and this is engaged by a tongue 22 on the rear end of the trigger-plate. The breech-block 25 slides upon the trigger-plate and has a cocking piece or lug 26 extending through ejector opening 27. The recoil spring 28 is seated in a bore in the breech-block and abuts against a member 29 of the trigger-plate (specifically, this may be a pin) fixed in the upstanding lug 30 at the rear of the plate. A spring-guide 31 is placed within the rear end of the recoil spring, and this has a head 32 to directly engage abutment pin 29. Evidently, the recoil spring at all times urges the breech-block forward upon the trigger-plate, and when the barrel is in position the breech-block is thus normally held close against the breech. When the barrel is dismounted, the trigger-plate and other parts of the action carried by it are inserted forwardly through the bottom opening of the frame. This brings the front end of the breech-block against the inside of the front wall of the frame. The trigger-plate is then moved forward against the resistance of the recoil spring until flanges 20 clear the front end of the frame. The trigger-plate and associated parts are then moved bodily upward so that flanges 20 are opposite the front ends of channels 18 and tongue 22 is opposite its socket 21. The trigger-plate is then moved back so that the flanges engage their channels and the tongue engages the socket, and the recoil spring then acting through the breech-block securely retains the trigger-plate and other parts of the action in position. The parts can be quickly detached as a unit by first pushing the trigger-plate forward against the pressure of the recoil spring, until the tongue 22 is clear of socket 21 and flanges 20 are clear of channels 18. The rear end of the trigger-plate is then drawn downward and out, with the breech-block and other associated parts. No additional springs are necessary for this removable fastening of the action, the recoil spring being necessary in any case to actuate the breech-block, and the only purely fastening parts are the complemental engaging member of the trigger-plate and frame.

The firing-pin 35 is reciprocably mounted

in a hole in the breech block. The firing-pin is, in turn, provided with a hole to receive firing-pin spring 36, and this spring is provided with a guide abutting against member 30 of the trigger-plate. In addition to actuating the firing-pin for firing, spring 36 aids the recoil spring in holding the action in position, because through the firing-pin it also urges the breech-block forward and the trigger-plate back. At the front of the firing-pin is the point 37 extending through a hole provided for it in the breech-block, and at the rear the firing-pin is provided with a cock-notch 38. The sear 39 is pivotally mounted in the trigger-plate. The sear spring 42, mounted in a socket in the trigger-plate, urges the sear to engagement with the firing-pin. A part of the sear extends downward and is provided with a notch 43 to be engaged by the connector 47.

Back of the sear is the trigger 44 pivoted at 45 and returned by spring 46. The trigger does not directly engage the sear. A connector 47 is pivoted to the trigger 48 and has a pawl or point 49 to engage the connector notch on the sear. Connector 47 also has a cam 50 over which one bottom edge 51 of the breech-block slides. At the rear end, this edge of the breech-block is provided with a cam 52 which coöperates with cam 50. The connector is urged upward by a spring-pressed pin 53, carried by the trigger, and engaging a pin 54 on the connector. So far, I have described all of the action except parts directly concerned with feeding the cartridges, the ejector and the extractor.

The operation is as follows: The breech-block is normally held against the breech by recoil spring 28. Fig. 10 shows the breech-block in this position and also shows the firing-pin released, and it may be assumed that a cartridge has just been fired. The firing reaction moves the shell and the breech-block with firing-pin 35 back against the recoil spring 28 and firing-pin spring 36, until sear 40 engages with cock-notch 38 of the firing-pin. The shell is ejected through slot 27 by means which will be described later. The firing-pin is retained in retracted position and the breech-block returns immediately toward the breech, carrying with it a cartridge which has been fed in front of the breech-block, as will be later described. To fire, the trigger is pulled moving the connector forward, and the connector engages notch 43 in the sear and rotates the sear so that the rear end of sear 40 is drawn down, releasing the firing-pin. Firing-pin spring 36 then drives the firing-pin forward and point 37 fires the cartridge. Trigger 44 cannot be manually released in the short time elapsing before the breech-block will come back again, and to prevent unintentional repeating an automatic sear-release is provided, consisting of the pivoted connector, its cam 50, and the cam carried by the breech-block. Breech-block cam 52 engages cam 50 as soon as the breech-block starts back and depresses the connector, carrying connector pawl 49 out of engagement with the sear. The sear immediately springs into active position irrespective of the position of the trigger and reëngages the firing-pin as soon as the firing-pin is brought back by the breech-block, and then to fire again the trigger must be released and again pulled. The release of the trigger permits the connector pawl to spring back into engagement with the sear 43. This releasing mechanism not only prevents unintentional repeating, but absolutely prevents firing by means of the trigger, except when the breech is fully closed. Evidently, when the breech-block is in any other than its forward position, it holds cam 50 down and positively prevents any connection being effected between the trigger and the sear, and, therefore, the sear cannot be operated to release the firing pin.

A positive safety lock is provided, consisting of a pin 60, transversely movable in a socket in the trigger-plate and held by a spring-pressed plunger 61, engaging a groove 62 in the pin. This groove is provided with depressions 63, 64, at either end to locate the pin in locked or unlocked position. The pin is also provided with a slot 65 adjacent to a dependent locking member 66 of the sear. When the safety-pin is put in the position of Fig. 14, locking member 66 of the sear is opposite slot 65 in the pin, and the sear can be freely moved by the trigger when the breech block is in proper position. But, when the pin is pushed to the other end of its travel, locking member 66 on the sear is opposite a solid part of the pin and cannot move, and the sear is thus positively locked into engagement with the firing-pin and the firing-pin cannot be released.

The cartridge-channel 13 in the upper part of the frame or receiver has been mentioned. At its rear end, this channel connects with the magazine-tube 5, but shortly straightens so that for the greater part of its length it is parallel with the barrel-bore. At the forward end of the channel is located a cartridge-guide 70 which is conveniently a separate piece, but might otherwise be integral with the frame. This guide is provided at its sides, near the top thereof with ribs which enter the corresponding grooves in the frame. The guide is inserted from the front and shoved back, and when the barrel is put in position the rear end of the barrel securely holds the guide in place. The interior of this guide is substantially a continuation of the cartridge-channel. At its rear end, at each side, is a diagonal

groove 71. These grooves, together, form a cam-guide for the base of the shell. At its forward end the guide has a diagonal face 72 constituting a cam to guide the bullet. As clearly seen in Fig. 10, if a cartridge is shoved forward from the channel 13 into the guide, the bullet will encounter cam 72 and at the same time the base of the shell enters grooves 71 and continued forward movement of the cartridge will cause it to move bodily forward and downward, preserving its parallelism to its original position until the bullet is substantially in the rear end of the chamber. As soon as the cartridge moves slightly downward in the cams, the base of the shell is below the line of travel of the breech-block, and when the breech-block comes forward its face 73 will strike the rear end of the shell and push the cartridge forward into the breech. To control the movement of the column of cartridges, a positive stop 74, shown in perspective in Fig. 8, is provided. In this the stop proper is the member 75′ projecting into channel 13 somewhat to the rear of the guide, as shown in Fig. 7. The stop has a pivot 75 engaging a socket in the frame and a cam-shaped end 76 coöperating with cam members carried by the breech-block.

Fig. 13 shows cam face 77 at one side of the breech-block and cam-pin 78 adjacent to cam 77 with the stop-cam 76 between them. In this view, the stop-piece 74 has been removed from the frame and dropped upon the breech-block in proper position, so that if it is imagined the pivot 75 is stationary and the breech-block slides back and forth, the correct operation of the parts will be easily understood. The stop 75′ does not enter the channel far enough to interfere with the bullets or the bodies of the shells, but only engages the shell heads. Entering the channel of guide 70, near the forward end thereof, is a support 80 which may conveniently be the bent end of a spring 81 engaging a socket 82 in the frame and held in tension by a pin 83 therein. The support 80 passes through a hole in the side wall of the guide, and in addition to its cartridge-supporting function evidently serves to retain the guide in position in the frame when the barrel is removed and the guide is made a separate piece. In this case, removal of the spring will, evidently, permit the guide to be removed. The support 80 holds the cartridge in the guide when the breech-block is retracted, and until the breech-block returns toward the barrel. When the cartridge is in firing position, as shown in Fig. 10, and the breech-block is closed, there is a cartridge in guide 70 engaging cam 72 and cam grooves 71 and prevented from advancing farther by engaging on its lower side with the upper face of the breech-block. Behind this is another cartridge in channel 13, its bullet engaging behind the cartridge, first-mentioned, and all being, of course, urged forward by the magazine spring. Upon firing, as soon as the breech-block moves back a short distance, cam 77 actuates the free end 76 of the stop-piece so that stop 75′ is moved into channel 13 behind the cartridge in the guide and slightly in front of the head of the next following cartridge, the distance between the stop and the cartridge head being, say, about one-eighth of an inch. The stop remains in this position while the breech-block goes all the way back and until it returns almost to the limit of its forward movement. As soon as the front end of the breech-block moves back, clear of the head of the cartridge, in the guide, the magazine spring moves forward the whole column of cartridges until the head of the second cartridge engages stop 75′, and it, with all the cartridges behind it in the column, is arrested and held. The bullet of this second cartridge is then just slightly within the channel of the guide, as shown in Fig. 2. The forward cartridge has by the movement of the whole column been moved forward in the guide until it is engaged by support 80, and at this time the base of the shell has moved downward into the path of the breech-block. The support now holds the cartridge in the same position in its guide until the breech-block again goes forward and the forward end 73 of the block strikes the rear face of the cartridge head. The further forward movement of the breech-block then pushes the cartridge forward and the guide at the same time forces it downward in parallel position until the bullet enters the breech and the breech-block then shoves the cartridge fully into the barrel and holds it ready for firing. Slightly before the breech-block fully closes, cam-pin 78 engages the free end of stop-piece 74 and moves stop 75′ out of the cartridge-channel, releasing what is now the foremost cartridge in the channel, and the magazine-spring then moves the whole cartridge column until the foremost cartridge is within the guide and rests upon the upper face of the breech-block.

The ejector mechanism may vary considerably, but in the preferred construction it comprises the two ejector lugs 85 located on the side walls of the guide to the rear of cam grooves 71 projecting downward into the rearward path of the cartridge-head, as shown in Figs. 5 and 7. An extractor 86 is also located in a groove in the front end of the breech-block and pressed forward by a spring. This extractor is arranged to engage the lower side of the cartridge head. When the shell comes rapidly back after firing, the upper edge of its base strikes lugs

85 and the forward end of the shell is thus snapped sharply downward and the shell forcibly thrown through slot 27 to the ground. When the bolt goes forward to feed the cartridge into the chamber the base of the cartridge is flat against the front face 73 of the block, and as the block goes forward the shell is shoved straight down by the cam guides. The lower edge of the flanged base is thus inserted in the extractor 86.

The upper face of the breech-block is provided with channels 90 to accommodate the lower edges of the side walls of guide 70 and between these is a land or flat ridge 91 extending straight back from the point 73 upon which the cartridge rests while it is in the guide before and during the rearward movement of the block.

The mechanism is accommodated to a take-down barrel construction, as follows: The frame is provided with a front opening *s* to receive the barrel. This is provided with interrupted threads 95 and the rear end of the barrel is provided with complemental threads 96. Instead of interrupted threads, continuous threads may be used and the barrel then inserted or removed by giving it several turns. A short distance from the end of the barrel these threads are made continuous as at 97, and an adjustable abutment nut 98 is screwed upon the continuous threads and pinched or tightened on threads in any suitable way so that it will not accidentally turn. The nut is usually provided with holes 99 by which it may be turned when adjustment is necessary. The barrel also carries a lug 100 connected to the barrel forward of the nut and reaching back under the nut and terminating in a face 101 which abuts against the front end of the trigger-plate when the barrel is in position. At this point the trigger-plate is provided with a vertical slot 102. At one side of this slot is a stop-pin 102ª. Located in lug 100 is a sliding latch 103 provided with an extended finger-piece 104 and yieldably held in position by a spring-pressed plunger 105. Latch 103 coöperates with slot 102 in the forward end of the trigger-plate. To put the gun together, the end of the barrel is inserted in frame-hole *s*, in such position that the interrupted threads are free from each other. The barrel is then turned until the threads pull the barrel firmly into position with the base of nut 98 resting against the frame. At this point barrel lug 100 encounters stop 102ª and is prevented from turning further. Latch 103 is then opposite slot 102 and the latch is drawn back and positively locks the barrel against rotating in the opposite direction. If any looseness occurs, nut 98 may be set up tight while the barrel is in position. When the barrel is in position it affords a positive fastening for the action, by reason of lug 100 resting in front of the trigger-plate.

In other forms of the invention the barrel locking parts could be arranged so that the action could be removed without reference to whether the barrel were in place or not. Evidently, also, the position of the barrel locking parts could be interchanged so that the latch is on the frame or trigger-plate and the socket carried by the barrel. The butt-stock may be fastened to the frame in different ways, but the drawing shows a preferred method of fastening. This consists of a screw 110, the head of which engages the back of the pistol grip and the threaded end of which is screwed into socket 111 in the frame.

Some of the details of construction of the trigger-plate, breech-block and associated parts, in addition to those already pointed out, are of considerable importance. Fig. 10 shows that the cartridge-channel 13 in the frame is open at the bottom toward the rear end. This open bottom of the channel is closed, when the trigger-plate is in position, by lug 30, which carries in its inclined face a groove 31ª in which the cartridges slide. At its rear end the breech-block has a slot 25ª in which lug 30 of the trigger-plate is accommodated when the breech-block moves back. Lug 30 also has a forward extension 30ᵇ which lies over the rear end of the firing-pin when the gun is cocked. This assists in preventing the firing-pin from accidentally springing away from the sear. Recoil spring 28 is located in one side of the breech-block and its abutment 29 is carried at one side of lug 30. This allows for sufficient travel of the breech-block and at the same time for an ample long spring. Firing-pin spring 36 abuts directly against the front face of lug 30.

Many features of the invention are adaptable to non-automatic guns. The feeding mechanism, including the cartridge-guide and the breech-block arrangement, are a few examples of this. Other features of the invention are applicable to firearms whether they are automatic or not, breech-loading or not, such, for instance, as the barrel-fastening and adjusting mechanisms.

Persons skilled in the art will understand many advantages of the invention and possible modifications not particularly referred to for the sake of brevity.

I claim:—

1. In an automatic gun, the combination of a receiver, a breech block and trigger plate, a sear pivoted to the trigger plate and having an arm extending rearward and another arm extending downward, a firing pin adapted to engage said rearward extending

arm, a safety stop adapted to engage the downward extending arm, a trigger pivoted rearward of the sear, and a connector pivoted to the trigger and extending forward to engage the sear.

2. In an automatic gun, the combination of a receiver, a breech block and trigger plate, a sear pivoted to the trigger plate and having an arm extending rearward and another arm extending downward, a firing pin adapted to engage said rearward extending arm, a safety stop adapted to engage the downward extending arm, a trigger pivoted rearward of the sear, a connector pivoted to the trigger and extending forward to engage the sear, the breech block and connector being provided with coöperating means to free the connector from the sear.

3. In an automatic firearm, a barrel, a butt-stock and a box-frame between said barrel and stock, said frame having a solid unbroken top and sides, a front wall receiving the barrel and otherwise solid, a rear wall, a magazine in the butt-stock entering the rear wall of said frame, said wall being otherwise unapertured, said frame being provided at the bottom with an ejector opening, and loading, firing and ejecting mechanism within said frame.

4. In an automatic firearm, the combination of a butt-stock, a magazine therein, a barrel, a box-frame connecting the butt-stock and barrel, said frame having solid, unapertured top and sides, an open bottom, a solid front end unapertured except for a barrel opening, a solid rear end unapertured except for a magazine opening, and a trigger plate closing the bottom of said frame, the trigger plate being provided with an ejector opening.

5. In a firearm, the combination of a frame, a butt-stock and a barrel, a removable action in the frame and means carried by the barrel for securing the action in position.

6. In a firearm, the combination of a butt-stock, a frame, a removable action therein and a take-down front portion comprising a barrel and forearm, and means carried by said front portion having means for securing the action in position.

7. In a firearm, the combination of a butt-stock, a box-frame having a bottom opening, a removable action within the frame constructed and arranged so that it may be removed through said bottom opening, and means for securing the action in position.

8. In a firearm, the combination of a butt-stock, a box-like frame having a bottom opening, a removable unitary action within the frame and quick acting means for fastening the action in position and permitting it to be quickly removed as a unit through said bottom opening, as desired.

9. In a firearm, the combination of a butt-stock, a box-frame having a bottom opening, a removable unitary action therein, a latch device for quickly securing the action in position and permitting it to be readily removed, a demountable barrel, and means by which mounting the barrel positively secures the action in position.

10. In a firearm, the combination of a butt-stock, a frame having a bottom opening and a removable action therein comprising a trigger-plate, a breech-block movable thereon, a spring for actuating the breech-block, and means by which said spring holds the action removably in position in the frame.

11. In a firearm, the combination of a butt-stock, a frame having a bottom opening, a removable action therein comprising a trigger-plate, a breech-block movable thereon, a spring for actuating the breech-block, and frame engagement devices on the trigger-plate whereby said spring detachably secures the action in position in the frame.

12. In a firearm, the combination of a butt-stock, a receiver, an action therein, a cartridge-channel in the receiver above the action, and a magazine in the stock communicating with the channel.

13. In a firearm, the combination of a butt-stock, a receiver, an action therein, including a movable breech-block, a cartridge-channel in the receiver above the breech-block, and a magazine in the stock communicating with the channel.

14. In a firearm, the combination of a butt-stock, a receiver, an action therein, a cartridge-channel in the receiver above the action, a barrel, a feed-guide between the channel and the barrel, and a magazine in the stock communicating with the channel.

15. In a firearm, the combination of a butt-stock, a receiver, an action therein, a cartridge-channel in the receiver above the action, cam members at the forward end of the channel to guide a cartridge into the breech, and a magazine in the stock communicating with the channel.

16. In a firearm, the combination of a butt-stock, a receiver, an action therein, a barrel, a cartridge-channel in the receiver above the action and communicating with the barrel, a movable stop coöperating with the action and entering the channel adjacent to the barrel, and a magazine in the stock communicating with the channel.

17. In a firearm, the combination of a butt-stock, a receiver, an action therein, a barrel, a cartridge-channel in the receiver above the action and communicating with the barrel, a cartridge-support in the channel adjacent to the barrel, and a magazine in the stock communicating with the channel.

18. In a firearm, the combination of a butt-stock, a receiver, an action therein, a barrel, a cartridge-channel in the receiver above the action and communicating with the barrel, a spring-actuated cartridge-support in the channel adjacent to the barrel, and a magazine in the stock communicating with the channel.

19. In a firearm, the combination of a butt-stock, a receiver, an action therein, a barrel, a cartridge-channel in the receiver above the action and communicating with the barrel, a positive cartridge stop coöperating with the action and entering the channel near the barrel, a spring-cartridge-support intermediate the stop and the barrel, and a magazine in the stock communicating with the channel.

20. In a firearm, the combination of a butt-stock, a barrel, a receiver, a sliding breech-block therein, a recoil spring therefor a cartridge-channel in the receiver above the breech-block, and a cartridge-guide at the forward end of the channel to move a cartridge into the path of the breech-block.

21. In a firearm, the combination of a butt-stock, a barrel, a receiver, a sliding breech-block therein, a recoil spring therefor, a cartridge-channel in the receiver above the breech-block, and a guide-cam at the forward end of the channel to guide the cartridge forward and downward into the chamber.

22. In a firearm, the combination of a butt-stock, a barrel, a receiver, a cartridge-channel therein near the top, a magazine in the butt-stock communicating with the channel, a sliding breech-block below the channel, and a guide-cam intermediate the channel and the barrel to guide the cartridge downward into the path of the breech-block and into the chamber.

23. In a firearm, the combination with a butt-stock, receiver and barrel, of a cartridge-channel near the top of the receiver, a magazine in the stock communicating with the channel, and a cartridge-guide intermediate the channel and the chamber, said guide comprising a cam for the bullet and a cam for the shell-head, a reciprocating breech-block below the channel, and means for feeding cartridges through the channel and downward through the guide to the barrel.

24. In a firearm, the combination with a butt-stock, receiver and barrel, of a cartridge-channel near the top of the receiver, a magazine in the stock communicating with the channel, a breech-block reciprocating below the channel, a cartridge-guide intermediate the channel and the chamber, said guide comprising a cam for the bullet and a cam for the shell-base, whereby the cartridge is guided downward toward the chamber and into the path of the breech-block with its axis parallel to its position in the channel, and means for feeding cartridges through the channel.

25. In a firearm, the combination with a butt-stock, receiver and barrel, of a cartridge-channel in the receiver, a magazine in the stock communicating with the channel, a breech-block reciprocating near the channel, a cartridge guide intermediate the channel and the chamber, said guide comprising a cam for the bullet and a cam for the shell-base, whereby the cartridge is guided toward the chamber and into the path of the breech-block with its axis parallel to its position in the channel, means for feeding cartridges through the channel, a positive stop entering the channel and actuated by the breech-block to regulate movement of the cartridges.

26. In a firearm, the combination with a butt-stock, a receiver, and barrel, of a cartridge-channel in the receiver, a magazine in the stock communicating with the channel, a breech-block reciprocating near the channel, a cartridge-guide intermediate the channel and the chamber, said guide comprising a cam for the bullet and a cam for the shell-base, whereby the cartridge is guided toward the chamber and into the path of the breech-block with its axis parallel to its position in the channel, means for feeding cartridges through the channel, and a spring-actuated cartridge support to hold a cartridge in said guide during retraction of the breech-block.

27. In a firearm, the combination with a butt-stock, receiver and barrel, of a cartridge-channel in the receiver, a magazine in the stock communicating with the channel, a breech-block reciprocating near the channel, a cartridge-guide intermediate the channel and the chamber, said guide comprising a cam for the bullet and a cam for the shell-base, whereby the cartridge is guided toward the chamber and into the path of the breech-block with its axis parallel to its position when in the channel, means for feeding cartridges through the channel, a positive cartridge stop entering the channel and actuated by the breech-block to regulate movement of the cartridges, and a spring-actuated cartridge-support to hold a cartridge in said guide during retraction of the breech-block.

28. In a firearm, the combination of a butt-stock, receiver and barrel, a cartridge-channel in the receiver, a guide-cam intermediate the channel and the barrel-chamber, a magazine in the butt-stock communicating with the channel, a feed spring in the magazine behind the column of cartridges, a breech-block reciprocating within the receiver adjacent to the channel and guide

and arranged to engage and hold the forward cartridge when closed, so that when the breech-block is retracted the cartridge is fed forward and directed by the guide toward the chamber and into the path of the breech-block.

29. In a firearm, the combination of a butt-stock, receiver and barrel, a cartridge-channel in the receiver, a guide-cam intermediate the channel and the barrel-chamber, a magazine in the butt-stock communicating with the channel, a feed spring in the magazine behind the column of cartridges, a breech-block reciprocating within the receiver adjacent to the channel and guide, a cartridge-stop entering the channel, and cams on the breech-block to actuate the stop.

30. In a firearm, the combination of a butt-stock, receiver and barrel, a cartridge-channel in the receiver, a guide-cam intermediate the channel and the barrel-chamber, a magazine in the butt-stock communicating with the channel, a feed-spring in the magazine behind the column of cartridges, a breech-block reciprocating within the receiver adjacent to the channel and guide, a cartridge-stop entering the channel, cams on the breech-block for actuating the stop, and a spring-cartridge-support adjacent to the guide.

31. In a firearm, the combination of a butt-stock, receiver and barrel, a cartridge-channel upwardly located in the receiver, a cartridge-guide intermediate the channel and barrel-chamber, a breech-block reciprocating below the channel and guide, and an ejector abutment at the rear of the guide, and above a bottom ejecting opening in the receiver.

32. In a firearm, the combination of a butt-stock, receiver and barrel, a cartridge-channel in the receiver, a cam-guide intermediate the receiver and the barrel-chamber, a breech-block reciprocating near the channel and guide, and ejector lugs carried by the side walls of the guide in the path of the rearwardly moving shell.

33. In a firearm, the combination of a butt-stock, a barrel, a frame, and cartridge channel therein near the top, the frame being provided with a bottom ejector opening, a reciprocating breech-block within the frame below the channel, a cartridge-guide for guiding cartridges downward from the channel to the barrel, an extractor carried by the breech-block below the shell to engage the shell-base as it is fed forward, and ejector lugs at the rear of the guide to engage the top of the shell-base as it is pulled back, and cause it to be ejected through the bottom opening.

34. In a firearm, the combination of a receiver casing, a cartridge-channel near the top of said casing, a trigger-plate having an ejecting aperture, a breech-block slidably mounted on said plate below the channel and having a face adjacent to the cartridge-channel, a cartridge-guide at the forward end of the channel to guide cartridges into feeding engagement with the breech-block, a firing pin movably mounted in the breech-block, a sear carried by the trigger-plate, a trigger, and a connector carried by the trigger to actuate the sear.

35. In a firearm, the combination of a butt-stock, a barrel, a receiver having an open bottom, a trigger-plate having forward flanges to engage grooves in the receiver and a rearward tongue to engage a socket in the receiver, the trigger-plate having an ejector opening, a breech-block slidably mounted on the trigger-plate, and a spring engaging the breech-block and abutting against the trigger-plate for actuating said breech-block and holding the trigger-plate and associated parts in quick-detachable engagement with the receiver.

36. In a firearm, the combination of a butt-stock, barrel and receiver, a cartridge-channel in the receiver, a reciprocating breech-block and a cartridge-stop positively actuated by the breech-block to engage the column of cartridges upon rearward movement of the breech-block and to disengage the column upon forward movement thereof.

37. In a gun, the combination of a frame closed at the top and sides and open at the bottom, a trigger-plate removably located in the bottom of the frame and provided with a bottom ejecting opening, a reciprocating breech-block mounted on the trigger-plate, and a cocking lug on the breech-block projecting down through the ejecting opening for manually operating the arm.

38. In an automatic gun, the combination of a frame closed at the top and sides and having a bottom opening, a trigger-plate located in said bottom frame opening, and itself provided with an ejecting opening, a reciprocating breech-block carried by the trigger-plate, a recoil spring, sear and trigger mechanism for the breech-block, and a lug on the breech-block projecting down through the ejecting opening for manually operating the arm.

39. In an automatic gun, the combination of a frame having a cartridge-channel in the upper part thereof, the channel being interrupted at the bottom near the rear end of the frame, a trigger plate located in the lower part of the frame and having at its rear end an upwardly projecting member serving to close said opening in the cartridge-channel.

40. In an automatic gun, the combination of a frame having a cartridge-channel in the upper part thereof, the channel being interrupted at the bottom near the rear end

of the frame, a trigger-plate located in the lower part of the frame and having at its rear end an upwardly projecting member adjacent to the cartridge-channel, the member being provided with a groove to complete the interrupted part of the channel.

41. In an automatic gun, the combination of a frame having a cartridge-channel in the upper part thereof, the channel being interrupted at the bottom near the rear end of the frame, a trigger-plate removably secured in the lower part of the frame and having at its rear end an upwardly projecting member serving to close said opening in the cartridge channel.

42. In an automatic gun, the combination of a frame having a cartridge-channel in the upper part thereof, the channel being interrupted at the bottom near the rear end of the frame, a trigger-plate removably secured in the lower part of the frame and having at its rear end an upwardly projecting member adjacent to the cartridge-channel, the member being provided with a groove to complete the interrupted part of the channel.

43. In an autoamtic gun, the combination of a frame, a trigger-plate thereon, an upstanding lug at the rear end of the trigger-plate, a breech-block reciprocating on the plate and having a central rearward slot to accommodate the lug.

44. In an automatic gun, the combination of a frame, a trigger-plate therein, an upstanding lug at the rear end of the trigger-plate, a breech-block reciprocating on the plate and having a central rearward slot to accommodate the lug, a recoil spring seated in a hole in the breech-block at one side thereof, and a spring guide engaging against one side of said lug.

45. In an automatic gun, the combination of a frame, a trigger-plate therein, an upstanding lug at the rear end of the trigger-plate, a breech-block reciprocating on the plate and having a central rearward slot to accommodate the lug, a recoil spring seated in a hole in the breech-block at one side thereof, a spring guide engaging against one side of said lug, a firing pin reciprocably mounted in a hole substantially centrally placed in the breech-block, the firing spring seated in a longitudinal hole in the firing-pin, and a firing spring guide bearing against the front face of said lug.

46. In a firearm, the combination of a butt-stock, a barrel, a frame, a cartridge channel therein, a guide-cam intermediate the channel and the barrel, and an ejector lug on the guide-cam to engage the base of the shell during recoil and eject the shell downward.

47. In a firearm, the combination of a butt-stock, a barrel, a frame, a cartridge-channel upwardly located in the frame, a cartridge-guide between the channel and the barrel, a sliding breech-lock serving when closed to support a cartridge in the guide, a cartridge stop, and means by which said stop engages a cartridge when the breech-block is moved back.

48. In a firearm, the combination of a butt-stock, a barrel, a frame, a cartridge channel upwardly located therein, a cartridge guide-cam between the channel and barrel, a yielding stop to engage the cartridge in the guide, a positive stop to engage the cartridge just to the rear of the guide, a sliding breech-block serving when closed to engage the forward cartridge and to release it when open, and means by which the breech-block operates said positive stop.

JOHN M. BROWNING.

Witnesses:
ALF. ANDRI,
A. EALOPIN.