

J. D. PEDERSEN.

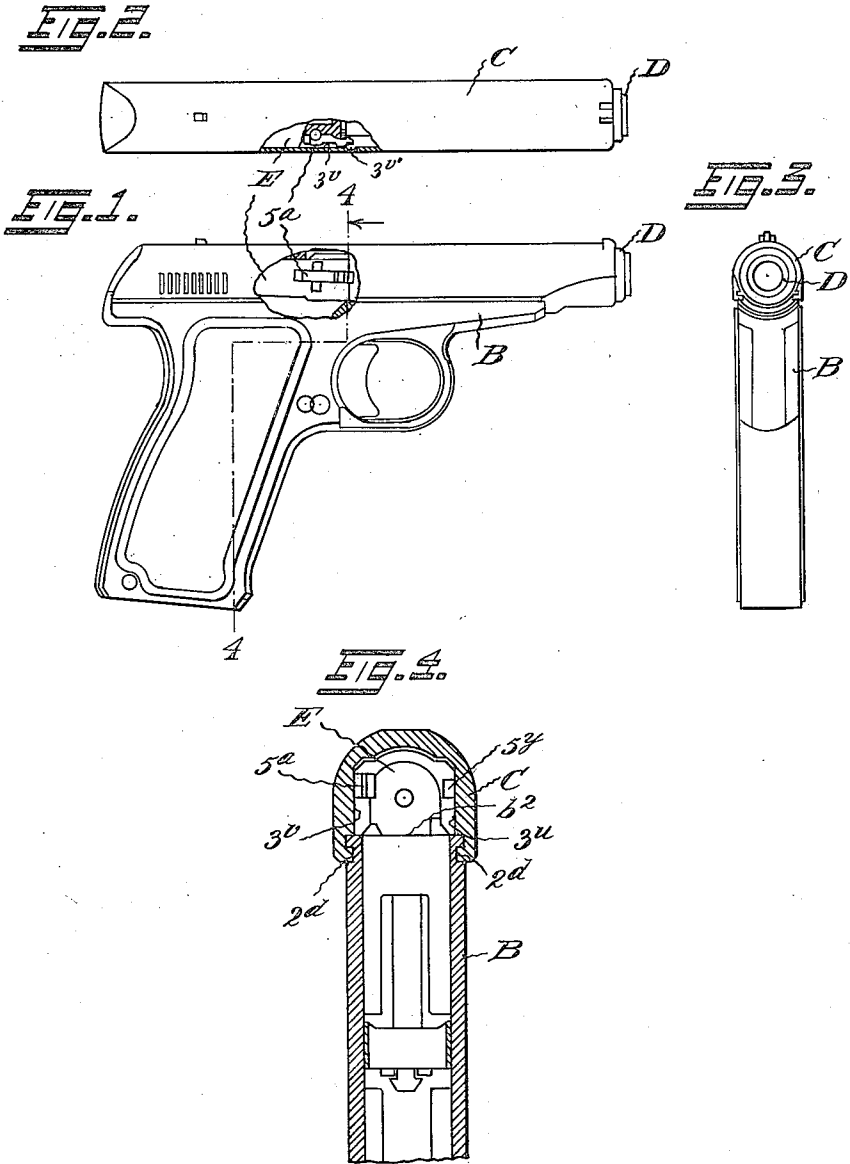
FIREARM.

APPLICATION FILED APR. 7, 1920.

1,401,552.

Patented Dec. 27, 1921.

5 SHEETS—SHEET 1.



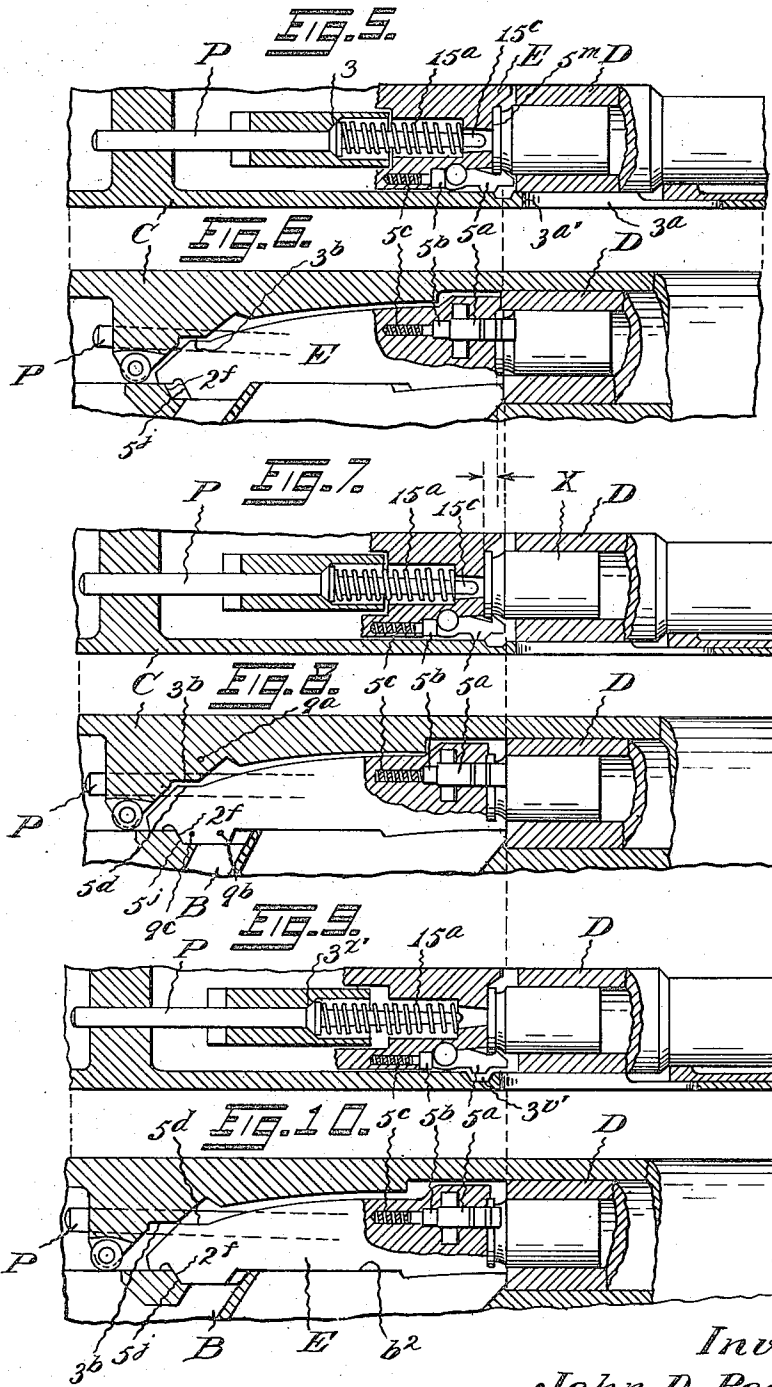
Inventor:  
John D. Pedersen,  
By his Atty, J. H. Richard.

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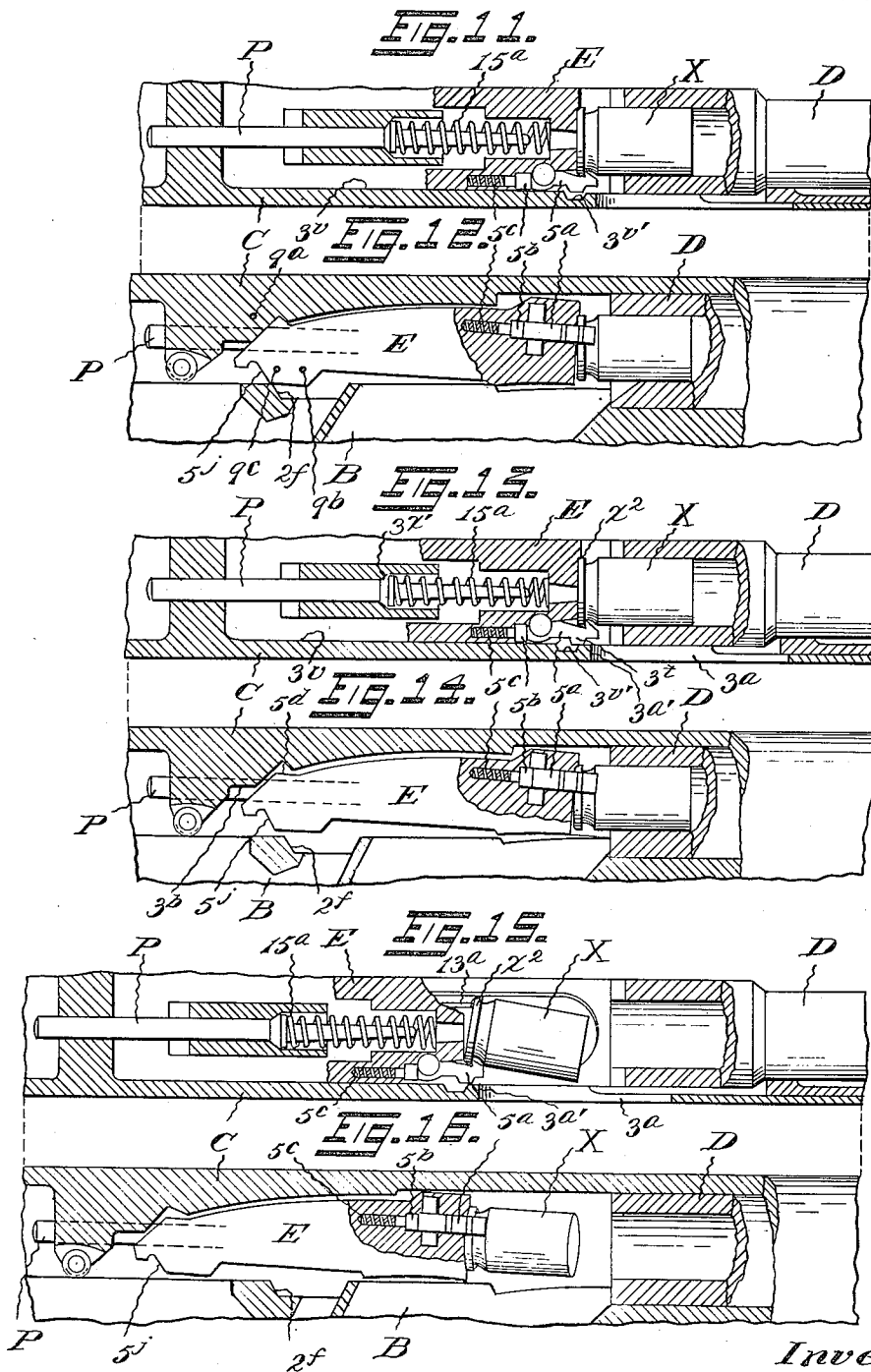
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5 SHEETS—SHEET 2.



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 John D. Pedersen,  
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# UNITED STATES PATENT OFFICE.

JOHN D. PEDERSEN, OF JACKSON, WYOMING.

## FIREARM.

1,401,552.

Specification of Letters Patent. Patented Dec. 27, 1921.

Application filed April 7, 1920. Serial No. 371,861.

*To all whom it may concern:*

Be it known that I, JOHN D. PEDERSEN, a citizen of the United States, residing in Jackson, in the county of Lincoln and State of Wyoming, have invented certain new and useful Improvements in Firearms, of which the following is a specification.

This invention relates more especially to extractor mechanism for that class of firearms which are usually designated as small-arms, and a principal object of the invention is to furnish an improved shell extracting mechanism particularly applicable to auto-loading and automatic shoulder-arms and pistols.

One class of small-arms to which my present improvements are applicable includes the auto-loading pistols in which a long-stroke operating-slide—sometimes termed the “power slide” or “momentum block”—is cooperative with a breech-bolt or like member having a relatively shorter stroke or working movement relatively to such slide. An improved auto-loading pistol of this kind is described in my Patent No. 1,348,733, dated August 3, 1920, and granted on my co-pending (renewal) application, Serial No. 311,689, filed July 17, 1919, and certain features of the extractor devices, or mechanism, herein described and claimed are also illustrated in my said patent to which reference may be had. Therefore, for convenience of illustration, I have herein illustrated my present improvements as arranged and applied to an auto-loading pistol of the particular style, and having the arrangement of power-slide and breech-block, shown in the drawings of said patent.

My present improvements while particularly applicable to auto-loading firearms, are especially related to the auto-ejecting function, and also to the auto-extracting feature of the operations or functions of the mechanism, since, in practice, the auto-extracting of the used shell naturally precedes and is usually necessary to the auto-ejecting feature, while the auto-loading operation normally follows both the auto-extracting and auto-ejecting of the shell. Therefore in respect of some of the subjects-matter defined herein, the specified combination is regarded as relating to an auto-ejecting fire-arm,

or to an auto-extracting firearm, (or to both, as the case may be), since, in practice, the automatic extraction and ejecting need not always be followed by an automatic loading-in of a fresh cartridge,—this may, in some instance, be inserted by hand, in which case the customary magazine (especially in small-arms) will remain unused, or may be omitted altogether.

In the accompanying drawings forming a part of this specification, Figure 1 is a side elevation of an auto-loading firearm furnished with my present improvements in shell-extractor mechanism; this view is a right-hand side view corresponding except in scale with the left-hand side view shown in Fig. 1 of said patent.

Fig. 2 is a plan view, as seen from above in Fig. 1, and Fig. 3 is a front elevation, as seen from the right-hand in Fig. 1; in Figs. 1 and 2, some parts are broken away for more clearly indicating certain details, as hereinafter more fully explained.

Fig. 4 is a sectional view in line 4—4 of Fig. 1, as seen from the right hand of said line 4—4.

Figs. 5 to 19 inclusive are a series of views for illustrating, as hereinafter more fully described, the several features and details of the improvements; these views from Figs. 5 to 18 inclusive are arranged in pairs comprising one sectional plan view, as Figs. 5, 7, etc., and one sectional side view as Figs. 6, 8, etc.

Fig. 20 is a plan view of the breech-block E, with some parts broken away for showing certain details cooperative therewith.

Fig. 21 is a view of the forward end of the breech-block with some parts broken away.

Figs. 22, 23 and 24, are respectively a plan view, a side view and an end view of the shell-extractor 5<sup>a</sup>, which is also indicated in plan view in Fig. 20.

Figs. 25 to 31 inclusive, are enlarged fragmentary diagrammatic view of parts shown in Figs. 5, 7, 9, 11, 13, 15 and 17, for more fully illustrating the several features and details of the improvements.

Fig. 32, is a fragmentary longitudinal sectional detail view showing the extractor pushing or pressing the cartridge into place in the cartridge-chamber of the barrel.

Fig. 33, is a fragmentary longitudinal

sectional view showing the extractor, after having pushed or pressed the cartridge into place in the cartridge-chamber, about to snap into position behind the rim of the cartridge for later extraction of the cartridge.

Figs. 34 and 35 are fragmentary detail sectional views of a modified form of extractor and a portion of the breech-bolt coactive therewith.

Figs. 36 and 37, are diagrams illustrative of the timing of the power slide and breech-block strokes relatively to each other and with relation to the frame of the firearm.

Similar characters designate like parts in all the views.

In a firearm of the kind illustrated in the drawings, the cartridge shell, as X, is driven rearwardly on the firing of the charge, and thus actuates a breech-block member, as E, which, in turn actuates in a rearward direction a long-stroke, slidably-supported member, as C, that constitutes a momentum block or actuator for operating other mechanism of the firearm. In Figs. 5, 6, the breech block, or breech-bolt, E, and the slide C are each shown in their extreme forward, or "firing" position, while in Figs. 15, 16, these members are both shown retracted to their extreme rearward position. The short rearward movement from said forward position (Fig. 5) to an intermediate position shown by Figs. 7, 8, is designated as the power stroke, since during this relatively short movement, the member E transmits to the slide C,—and thus stores up therein,—a large amount of force, or power, sufficient to continue said rearward movement thereof to the rearward position Fig. 15, and at the same time operate other mechanism (not herein shown) and also compress the usual reaction spring, not shown, for returning in due course, said slide C to the firing position, Fig. 5.

In the preferred arrangement of pistol mechanism herein illustrated and also shown and described in my said patent, the power-stroke of the block E is a relatively short one, and is limited by the face 5' thereof engaging forwardly of an abutment face 2' of the pistol frame B, as indicated in Fig. 8, the block being moved rearwardly by powder gases. During this power stroke, (from position Fig. 6, to position Fig. 8), of course the slide C and block or bolt E move together, since during that time-interval said bolt is the actuator of the slide. On reaching the position Fig. 8, however, the block is retarded relatively to the slide while the slide C continues moving rearwardly through another time-interval to position Fig. 16, the block E being locked thereto and moving concurrently rearwardly therewith, whereby the projectile is given time to leave the muzzle of the barrel D, and whereby the bolt member E is located in a more forward po-

sition as there shown, relatively to the slide. These changes of relative positions of the members E and C are made use of in my present improvements for locking and unlocking (see Figs. 5, 7, 13, 15, and 9 and 11, respectively) the extractor hook, 5<sup>a</sup>, as hereinafter more fully explained.

In the combination of breechaction members, the spring 15<sup>a</sup> may be regarded as constituting a combined or duplex actuator device, since, however supported at the rearward end, the forward end thereof operates as a block-advancing spring or device which is operative intermediate to the block E and slide C; and since, however supported at the forward end, the rearward end thereof operates as one kind of a firing-pin-retracting device which, also, is or may be operative intermediate to said block and the firing-pin. Thus a combined block-advancing device or spring and firing-pin-retracting device or spring is operative intermediate to the breech-block E and the firing-pin; and such device is so arranged that simultaneously on the retraction of the slide rearwardly of the power-stroke position thereof, the firing-pin is withdrawn to an ineffective position relatively to the block-face 5<sup>m</sup>, (Fig. 13), and the extractor is locked in its shell-extracting position upon the breech-block, and with its hook-end, 5<sup>a</sup>, in coöperative relation with said block-face. As regards its action and effects, therefore, the combined actuator-device not only retracts the firing-pin relatively to the slide to a limit fixed by the positioning face 3<sup>x'</sup> of the slide, but also through the advancing of the block E, relatively to the slide constitutes in effect an actuator by the power of which the slide-face 3<sup>v</sup> is engaged with the face 5<sup>z</sup> of the lockable extractor during a forward movement of the block relatively to the slide, as for instance from position Fig. 5 to position Fig. 13. Also, it will be noted that, in these preferred arrangements, said firing pin positioning face 3<sup>x'</sup> is located transversely of the guide-way faces and relatively to the line of longitudinal movement of the block within the block-chamber of the slide C; that the extractor-locking-face 3<sup>v</sup> of the slide is located in a direction, or position, relatively lengthwise of the slide and said line of block-movement, and, that said faces are thus arranged for simultaneous operation during a reciprocative movement of the breech-block relatively to the slide and while the slide is moving longitudinally upon the frame.

In the firearm mechanism herein illustrated the breechaction is retractable by a sliding movement on the frame and through a loading-stroke from a firing position, (Fig. 5), and the reciprocable block-operating action-member,—herein shown as a slide, C—has therein two parallel and oppositely-disposed plane faces, as 3<sup>u</sup>, 3<sup>v</sup>, Fig. 4, con-

stituting a guide-way for the breech-block. Said member C also has appurtenant thereto a firing-pin and a positioning face, 3<sup>v</sup> therefor. The breech-block is guided by  
 5 said guide-way faces and is reciprocable longitudinally of the frame within said guide-way, and has a block-face for supporting a cartridge in the barrel when the mechanism is in firing-position; also, the breech-  
 10 block has parallel side faces contiguous to and for bearing against said parallel faces, respectively, of the guide-way. The lockable extractor as 5<sup>a</sup>, is carried by the breech-block and is shown located in a recess in one  
 15 side face thereof, which locking-face, 3<sup>v</sup>, is cooperative with the extractor and is located on the said action-member contiguous to the extractor side of the breech-block (Fig. 5), and is arranged for the force of  
 20 the extractor-locking operation to be transmitted transversely through the breech-block against and opposite said inner face, 3<sup>v</sup>, Fig. 4, of the guide-way. And coacting with these parts, are means appurtenant to the  
 25 said action-member for limiting the longitudinal movement of the firing-pin and of the breech-block relatively to each other, and also relatively to the said action-member.

In the extractor arrangement illustrated  
 30 in Fig. 20, the draft-plug 5<sup>t</sup> has the forward or draft-face 5<sup>v</sup> located both transversely and radially of the breech-block, E, and the extractor-lock is so located on the slide C, as to operate the extractor in a direction  
 35 lengthwise of this plug and its said surface 5<sup>v</sup>, and radially of the breech-block. Thus the extractor-lock acts in such a way as to positively hold the hook 5<sup>n</sup> in the same position in which it is yieldingly held by the  
 40 spring 5<sup>c</sup> in Fig. 20. By locating the socket 3<sup>v</sup>, adjacent to the block-face 5<sup>m</sup>, the operation of the hook 5<sup>n</sup> is effected or accompanied by a liding movement of its forward  
 45 draft-surface 5<sup>v</sup> against and longitudinally of the forward surface of the socket 3<sup>v</sup>, thereby favoring the proper coaction of said parts under working conditions. Thus the extractor-lock, in the arrangement here  
 50 explained, due to contact of the surface 5<sup>n</sup> with the rim  $\alpha^2$  of the cartridge, acts in a direction for sliding said draft-plug into said socket, until the extractor-hook, as 5<sup>n</sup>, comes to and is locked in the shell-extracting position thereof, Figs. 5 to 15.

When the extractor and its locking-means are applied in a breechaction of the character herein indicated, and in which, also, the block, as E, and a slide have substantially the described working or shiftable  
 60 relative movements, the extractor is normally locked into engagement with the cartridge rim simultaneously with or just prior to the bringing forward by forward movement of the slide of the firing-pin, as P,  
 65 which is loosely mounted in the slide, from

a retracted and ineffective position, (Fig. 19), and into a position, (Fig. 18), where the point 15<sup>c</sup> thereof can reach and fire the cartridge, the firing-pin being actuated for firing the cartridge by the firing member or  
 70 hammer, not herein shown, but illustrated and described in my said patent. Thus, during the forward movement of the breech-action into firing position, the extractor locking faces, 3<sup>v</sup>, 5<sup>t</sup>, come into engagement in  
 75 time to secure the extractor against a possible outward movement,—as by a blow or other accidental means,—just prior to the time when the firing-pin can be so operated as to fire the charge, and then to continue  
 80 this safe-guarding action during the power-stroke and also during the early part of the subsequent extraction of the empty shell immediately following that stroke.

Similarly comparing the relative movements of the main-slide and breech-block during the forward strokes thereof, Fig. 37 is drawn in alinement with and below  
 85 Fig. 36, so that the path of movement of the slide-point and the several positions of this point in said path, are the same in each of these diagrams. But it is convenient to  
 90 locate a separate block-point as 9<sup>c</sup> on the block E, and a separate slide-point as 9<sup>a</sup> on the slide C, (Fig. 8), so that the two  
 95 points, 9<sup>a</sup> and 9<sup>c</sup>, will be on the same vertical line  $z^{10}$ , at the beginning of the forward stroke, and will arrive together at the vertical line  $z^{11}$  (Fig. 37), when the slide and  
 100 block in moving forwardly, reach their positions relatively to each other, (and relatively to the frame B,) which are indicated in Fig. 6. From this position, the slide-point moves forward from line  $z^{11}$  to line  $z^{12}$   
 105 while the block-point moves down from position 9<sup>c3</sup> to position 9<sup>c2</sup>, (Fig. 37); this movement, as shown in the diagram, corresponds to a movement of the slide  
 110 and block from the positions in Fig. 12 to the positions in Fig. 10. The slide-point 9<sup>a</sup> now moves forward (through the described free-stroke), from the vertical line  $z^{12}$  to the inclined line  $z^{13}$ , (Fig. 37), while said block-point remains at 9<sup>c2</sup>;  
 115 this movement corresponds to the change of positions from Fig. 10 to Fig. 8. Next the slide-point 9<sup>a</sup> and block-point 9<sup>c</sup> move forward together from the said line  $z^{13}$  to the inclined line  $z^{14}$ , and thus bring the  
 120 slide C and block E from their positions in Fig. 8 to the positions in Fig. 6, relatively to the frame B, thereby completing an entire cycle of the said slide-and-block-movements.

For more conveniently comparing the  
 125 movements of the main-slide C and breech-block E, each relatively to the other, the rearward and forward strokes of these members are illustrated in a diagrammatic manner in the two views, Figs. 36 and 37, respec-  
 130

tively, in which the line  $z^6$  may be taken to indicate the path of a point, as  $9^a$ , (Figs. 8-12), of the main slide, while the line  $z^7$  indicates the path of a similar reference point, as  $9^b$ , on the rearward part of the breech-block. (These diagrams are not drawn to scale, and it will be understood that the distance between the path-lines  $z^6$  and  $z^7$  has no significance.) In Fig. 6, said slide and breech-block are each shown in their forward position so that the points  $9^a$  and  $9^b$ , (Figs. 6 and 36) are on a line  $z^2$ , which is at right-angles to the path-of-movement  $z^6$  of said point  $9^a$ . On firing the cartridge, the slide and block move back together (Fig. 8) through a power-stroke from line  $z^2$  to line  $z^3$ , (Fig. 36), thus bringing the block-point  $9^b$  to rest at  $9^{b2}$ . Next the slide moves through the free-stroke thereof (Fig. 10) and brings the slide-point  $9^a$  to the line  $z^4$ , (Fig. 36) while the block-point  $9^b$  remains at line  $z^3$ . The slide C now continues rearward (Fig. 6) and brings the slide-point  $9^a$  to line  $z^5$  (Fig. 36) while the block-point  $9^b$  is raised from  $9^{b2}$  (through the stroke required for disengaging the block from the frame-abutment, Fig. 6,) to the position  $9^{b3}$ ; and with the slide-point  $9^a$  and block-point  $9^b$  in said position  $9^{a4}$ ,  $9^{b3}$ , respectively, the slide and block next move together to the end of their rearward strokes (Fig. 16) indicated by line  $z^8$ , in Fig. 36.

By the term "firing position" as herein sometimes used with reference to a single member or to parts thereof, or with reference to some plurality thereof, I refer to the position or positions which such member or members, or such part or parts, normally occupy in the mechanism or relatively to co-acting a member or part, at a time when the firearm-mechanism as a whole is in a proper condition for the user to fire a cartridge by pulling the trigger.

From the foregoing description, it will now be understood that the term "breech-action" refers herein to that portion of the firearm mechanism which (in a breech-loader) is retractable rearwardly of, or relatively to, the barrel, the movement being for the purpose of first extracting the shell of a spent cartridge from the barrel and afterward inserting, or loading, a fresh cartridge in place thereof. Usually the element or part herein designated as the "breechaction" will involve or include some suitable means for effecting the forward or return stroke of this action from a retracted position thereof. While the usual power-spring, not herein shown, constitutes one preferable means for such purpose, other suitable and well-known springs, devices or actuation-means may be employed in lieu thereof, but in and for some of the combinations and functions herein set forth or defined, the presence or absence of such a device, or the use of a particular kind

or arrangement of the breechaction-forwarding means, is regarded as being immaterial.

The member E, as will now be evident, operates in various ways, and serves several different purposes. Since said member E, on the firing of the cartridge, supports the base of the cartridge shell, and for this purpose effects such support by a direct engagement with a recoil-abutment, as  $2^1$ , on the frame B, the member E may properly be regarded as being primarily a breech-bolt. In its capacity as a breech-bolt, the member E supports the cartridge against undue rearward movement during the time-interval while the operating slide, C, (as the main "carrier" of the mechanism) is moving rearwardly just prior to the shifting of the breech-bolt out of its said direct engagement with the frame, (see the diagrams, Figs. 36, 37, as elsewhere herein described). Thus the member E as regards certain of its purposes, is a completely separate element from the operating-slide C,—both physically and functionally. The member E is also an extractor-carrier and an extractor-retractor, and is arranged for shifting the extractor at the proper time forwardly along, or relatively to, the main-carrier or power-slide, as and for the purpose elsewhere herein more fully explained. Also, by reason of the described frame-engagement, the member E is a power-stroke-limiter for the main-carrier or slide, when this is a power-slide, while it also operates, but for a limited stroke only,—as a power-slide-actuator and as a power-transmitter from the cartridge to the power-slide. The rearward position of the member E is provided with means coöperative with complementary means on the main-carrier C, whereby the said portion of the breech-block member becomes or serves as a slide-engaging block-shifting means, thereby at the proper time (Fig. 6) to shift the member E itself out of its power-stroke-limiting engagement with the said frame abutment  $2^1$ ,—see Fig. 12.

The member E may be described as a slidable, single-piece, tiltable breech-block, arranged for retraction along the slide-ways  $2^d$  of the frame B and arranged for a stroke in excess of a cartridge-length; and as having on one (the lower) side thereof a power-stroke-limiting face  $5^1$  located in position for engaging a coacting abutment-face  $2^1$  located on the frame (in position for stopping said block-retraction at the end of a relatively short power-stroke) and having on another (the opposite) side thereof one of a pair of block-operating faces the other of which is on the power-slide, whereby to effect the disengagement of said limiting and abutment faces; the location of these two faces, respectively, should be in such relative positions as only begin the said dis-

engagement after a time-interval that is subsequent to the termination of the power-stroke of the breech-block.

The upper surface of  $b^2$  of the frame B constitutes a slide-way on and above which the forward end or head portion, of the breech-bolt member E is fitted to slide, while inclosed within the chamber-spaces of the main-carrier C,—Figs. 4, 5, 8, 9. Thus the bolt E is not only supported at its forward end upon and directly by the frame B, but it is prevented by the shape and arrangement of the slide-way surface from having any tendency to rotate or turn,—as if upon a longitudinal axis,—within the interior space of the main slide or carrier,—see Fig. 20.

Owing to the peculiarly simple manner in which the breech-block E is operably-arranged as between and relatively to the frame B and the power-slide C, this block may, in practice, be so freely fitted that it may have a slight but substantial amount of sidewise and vertical freedom of "play" between said frame and the members E and C; this feature provides for such a free working of these parts that even when much befouled by powder gases and sediment matter collecting thereon, this obstructive matter will be readily worked out by the movements of the mechanism, and thereby avoid any clogging of the operative devices from such causes.

My present improvements are adapted for use in firearms of various sizes and styles, including shoulder-arms of different varieties and calibers, and are particularly adapted,—especially as regards certain features of these improvements,—for use in those varieties of guns and pistols which are commonly designated as "auto-loading", and "automatic". Therefore, and in view of the circumstances that auto-loading pistols have become one of the more important branches of the firearms art, I have herein described and illustrated my invention as applied to, or embodied in, a firearm of this class; and in doing this I have, in the principal views, shown the firing-train provided with trigger devices arranged for a non-automatic operation of the firearm, whereby a separate pull upon the trigger will be required for each discharge of the arm.

Some suitable shell-extractor, as  $5^a$ , is pivoted in the breech-block (see Figs. 20 to 22) by means of a pair of trunnions  $5^x$  bearing in corresponding holes at  $5^z$  in the breech-block. At the rear end of the extractor, a hole is located in the breech-block for receiving the extractor spring  $5^c$ , (Fig. 20) and the front end of the extractor is swung inwardly by a plunger  $5^b$  which bears against the rear end of  $55^a$  of the extractor; this bearing point is so far outside of the axis of said trunnions, that the

effect is to yieldingly force the front end or claw  $5^n$  inwardly and toward the cartridge held on the recessed front end of the breech-block. This action is indicated in Fig. 20 by the solid and dotted line positions of the hook  $5^n$ . The extractor is also an indicator to show the operator of the arm, by sight or feeling, whether or not the chamber of the arm is charged. When there is no cartridge in the chamber the claw at  $5^n$  is moved inward considerably more than is common with an extractor of the ordinary type.

The claw  $5^n$  of the extractor  $5^a$  grasps the rim of the fired cartridge in the barrel-chamber and extracts this cartridge during the rearward movements of the breech-block in a manner similar, in a general way, to the usual operation of shell-extractors of the hook-form class. After the shell is drawn out of the barrel-chamber during the rearward movement of the breech-block it is ejected from the face of the breech-block by means such as the ejector-point  $13^a$ , Fig. 15, especially in connection with Figs. 15 and 16, by a comparison of said views as described, the said mode of operation will be evident.

The breech-block and its operating devices (not shown herein), may be said to constitute means for shifting the extractor  $5^a$  to the relatively forward position indicated by Fig. 13, at a time immediately preceding the ejection operation. This forward shifting movement is also accomplished while the cartridge shell is still well within the barrel (Fig. 13) so that the shell, during such shifting is retained under full control. In this manner the head-portion and flange  $x^2$ , of the cartridge-shell X, (Fig. 7) is closed in by the block-covering walls of the slide C, during the power-stroke. Thus the breech-block E is arranged to constitute an extractor-actuator, while the operating slide C is a member distinct from the breech-block, so that the arrangement here explained has the important feature of carrying the wall edge  $3^a$  well forward of the bolt-face  $5^m$  when this face is in firing position (Fig. 5), and thereby covering the outlet for gases which would otherwise occur in case a cartridge when fired should have a defective shell.

The initial retraction of the shell X, (Fig. 7) by the power-stroke brings the wall-edge  $3^a$  rearwardly, but this movement should not be sufficient to open a free side-wise outlet for the gases: but when the block E is in position Fig. 5, the further retraction of the operating-slide C, by drawing said wall-edge farther to the rearward, (as in 13), opens up such an outlet, so that in case of the premature firing of a cartridge having a split shell, the gases may freely pass out of said side opening, before the breech-block E shall

be disengaged or be lifted free of the frame, (Fig. 12), and before the breechaction as a whole shall begin its longer rearward movement or loading-stroke, as from position 5 Fig. 12 to position Fig. 16. Thus the different movements of the bolt E and slide C, together with other features as above mentioned, provides for locating the block E during the shell-ejecting operation, at a point forwardly of the firing-position thereof relatively to said slide. Also, this mutual change of relative positions of the slide and breech-bolt E, may serve to retract the point of the firing-pin (not herein shown) away from the bolt-face 5<sup>m</sup>, simultaneously with the said advancement of the extractor to the described forward position thereof relatively to the slide C.

The described rearward movement together of the main-slide and breech-block through the distance of the power-stroke of the breech-block, retracts the cartridge shell X, (Fig. 5) to the position where, later on, the operation of extracting and ejecting the empty shell will begin. During this power-stroke movement of the slide C, the ejection port 3<sup>a</sup> remains so far forward of the block-face 5<sup>m</sup> as to keep the slide-wall at 3<sup>a'</sup> (Fig. 13) well forward of the head-flange of the cartridge, (see, also, Fig. 18); from this position the slide C continues moving back while the block E is halted, and thus the ejection port is drawn back (Fig. 15), slightly to the rearward of the block-face 5<sup>m</sup>. When the slide C and block E are drawn farther back, as to the positions in Fig. 15, the cartridge shell is drawn by the extractor 5<sup>a</sup> forcibly against the ejector face at 13<sup>a</sup>, and following a well-known mode of action will be thereby thrown out through the ejection port 3<sup>a</sup>.

When the breech-block is arranged cooperative with a stroke-limiting frame-abutment, or otherwise arranged for being released from its power-stroke-limiting means by the described swinging thereof upwardly between the guide-way faces, the block-face, as 5<sup>m</sup>, (Fig. 5), is also swung or tilted to a changed position together with the lockable extractor, so that immediately following the end of the power-stroke the upper edge of the block-face 5<sup>l</sup> is advanced relatively to the lower edge thereof. This action naturally tends to restrict in a favorable manner, the position of the shell during the retractive or shell-extracting stroke of the breech-block following the said release thereof.

Should the cartridge by reason of an undersize shell or otherwise, be prematurely pushed into the barrel to firing position, (Figs. 32 and 33), the forward extractor face 5<sup>n'</sup>, (when properly constructed therefor) will then engage rearwardly of the rim  $\alpha^2$ , while the bolt E is still in an advanced position (the same as in Fig. 32), relatively

to the slide C, and so that the relief space 3<sup>v'</sup> is in position for permitting the extractor to move outwardly and thus freely ride over said rim  $\alpha^2$  as further illustrated in Fig. 33 by comparison with said Fig. 32. These coacting members may be so fitted and arranged that when the extractor is thus forced outwardly in riding over the rim  $\alpha^2$ , (Fig. 33), the outer edge or face at  $t^2$  on the extractor will engage forward of the corner or face at 3<sup>v'</sup> on the slide C and thus cause the forwardly-moving slide to advance the extractor and the bolt E to their extreme forward position before the slide-face 3<sup>v</sup> can pass over the extractor face 5<sup>l2</sup>, and thereby bring the said several parts into firing position,—as in Fig. 5,—with the hook 5<sup>n</sup> locked into engagement with the rim  $\alpha^2$ , ready for retracting the shell X in the manner as elsewhere herein already indicated.

During the loading-in of a cartridge, it may sometimes happen that the head X' of the shell, as X, Fig. 32, will be forward of the cartridge-supporting face 5<sup>m</sup> of the bolt E, so that the rim or flange  $\alpha^2$  of the head will not be under the hook-face 5<sup>n</sup> of the extractor. Should this condition occur during the forward movement of the bolt and before the slide C advances relatively to the bolt, the rim  $\alpha^2$  will be guided by the inclined prong-face 5<sup>n'</sup> into the head-seat  $\alpha^2$  of the bolt (Fig. 32) and for permitting this action, the forward end 5<sup>n</sup> of the extractor may move outwardly (against the force of the extractor spring, whatever the form thereof) to allow said head-rim to pass,—see Fig. 31.

In case of a mis-location of a cartridge, the breeching mechanism has advanced to bring the block E to the position shown in Fig. 32, the cartridge will have been so far advanced into the barrel D, that the shell, as X, thereof will become truly aligned and positioned, so that during a further forward movement of the slide C relatively to the block E, the slide-face 3<sup>v</sup> may pass over the extractor face 5<sup>l2</sup> (Fig. 31) and then positively lock the extractor hook 5<sup>n</sup> into the groove  $\alpha^3$  forward of the cartridge head X', (in the same manner as indicated in Fig. 25). The cartridge being now fired, the block E and slide C move back together to position Fig. 26, so that during this power stroke the extractor hook 5<sup>n</sup> is continued in its said positively-locked position, and thus tends to hold the head X' of the shell securely engaged with the block E. Thus during the earlier portion of the shell-extraction period, said locking of the extractor operates for preventing any accidentally releasing of the said shell-and-bolt engagement.

By the term "loading-stroke" as herein used with reference to the breech action or

to a member thereof, or used in defining a subject-matter involving such a member, I refer to the relatively long rearward and forward movement whereby the shell of one cartridge will be withdrawn from, and a fresh cartridge be inserted into, the barrel; and this stroke whether more or less than a cartridge-length, I designate as the loading-stroke, and also as a loading-stroke in suitable correspondence with a cartridge-length. In some instances, especially when the breech action shall be arranged only for being operated manually, the loading-stroke may be of a length somewhat or considerably less than the length of such a cartridge as is suitable for use in the firearm, since the cartridge may then be inserted by hand, one at a time, and in a well-known manner, forwardly of the retracted breech-bolt. In magazine breechloading firearms, however, and especially when such arms are also auto-loading, the loading-stroke of the breech action as a whole and also of the breech-bolt member thereof, should usually be of a length somewhat in excess of a cartridge-length, and I have therefore adopted this latter arrangement in the accompanying drawings, in which my present improvements are shown arranged for use in a breechloading firearm which is not only magazined, but is also auto-loading.

The advanced position shown in Fig. 5, of the breech-bolt member E relatively to the slide C, may be maintained,—as regards the operation and principal functions of my present invention,—during the long stroke of the slide from position Fig. 5, rearwardly to position Fig. 16, and then during the reverse stroke forwardly to said position Fig. 5. While it is not deemed material to my improved extractor device or mechanism as to what means shall be employed for maintaining the described relative positions of the members E and C, during said rearward and forward strokes, I have herein shown these members of a form and arrangement whereby the rearward end 5<sup>1</sup> of the member E may be lifted out of engagement with the frame abutment when the slide has reached the position herein shown in Fig. 12. In my prior application aforesaid, I have described and claimed improved means and a preferred arrangement thereof, for effecting the said operation and said position—maintenance, but a more particular description thereof appears to be unnecessary to a proper understanding of the subject-matter of this present application. It should be understood, however, that my present improvements do not require that the bolt-member, as E, shall have any movement (either at one end or the other end thereof) in a direction transverse to the longitudinal movements thereof, since, in practice, any suitable means or devices (not herein

shown) may be employed for effecting the desired change of position of the forward end of the bolt-member relatively to the slide-member and for effecting such change at the proper time in the cycle of operations.

For more fully exhibiting the nature and scope of my present improvements, the extractor device is shown in two arrangements, each of which is illustrated by a separate series of detail views. In each said arrangement, the extractor device is shown operatively mounted upon and carried directly by the bolt member of the mechanism. Also, in each arrangement, the hook 5<sup>a</sup> of the extractor device is on the forward end of a longitudinally-disposed arm which has a transverse draft-face and is also operated inwardly by a spring that is located lengthwise of the member E and rearwardly of said draft-face. In one of these arrangements the draft-face 5<sup>x'</sup> (see Figs. 20 to 24) is on the forward side of a transverse portion forming a vertically-disposed trunnion, or journal 5<sup>x</sup>, whereby the arm 5<sup>a</sup> is permitted to move outwardly and inwardly by a swinging movement about an axis, as 5<sup>x2</sup>, of such journal-portion of the extractor member. In the other and preferred form and arrangement of the extractor device, the draft face, as 5<sup>p'</sup>, Fig. 34, is on a projection 5<sup>p</sup>, which is located in a horizontal direction and also transversely of the extractor arm 5<sup>a'</sup>; this arm, in the form herein shown, has also a kind of swinging movement, but of a modified character as compared with the arm 5<sup>a</sup> in Fig. 20.

In each of the described arrangements, the extractor hook-end, this comprising the arm 5<sup>s</sup> and hook 5<sup>n</sup>, may be said to be hingedly supported upon the block or bolt member E. In one arrangement,—Figs. 20 to 24,—the arm 5<sup>s</sup>, is movable by a pivot-hinge construction, whereas in the other arrangement, the arm 5<sup>a'</sup> is movable by means of a spring-hinge construction. The latter arrangement, besides reducing the number of separate pieces otherwise required, has the obvious advantage of imparting to the hook-end a minimum of angular movement during the required amount of working movement inwardly and outwardly, as when the hook 5<sup>n2</sup> is forced over the rim of the cartridge. Also, the more simple mode of action which is obtained in part by means of the improved one-piece construction of the extractor device, provides for a more favorable coaction of said device with the locking face, as 3<sup>r</sup>, of the operating slide C.

The manner of assembling the extractor 5<sup>a'</sup> with the block E, is illustrated in Fig. 34, where said member 5<sup>a'</sup> is indicated as being in about a half-way position during the process of sliding it into place while the hook-end 5<sup>n2</sup> is swung outward by a flexing

of the spring-arm portion 5<sup>aa</sup> thereof. In starting this assembling operation, the rearward end 5<sup>x'</sup> is slipped into engagement with the block by engaging the ribs 55<sup>da</sup>, only one thereof being shown, in the block-grooves 5<sup>k</sup>, one being shown, and then pressing in the spring-arm as indicated by the arrow 1, while the extractor device is forced rearwardly by pressure applied to the forward end thereof, as indicated by the arrow 2. During this operation, the draft-plug 5<sup>p</sup> rides along on the block surface at 5<sup>q</sup>, until the proper longitudinal position is reached, when the spring-arm causes the forward part of the extractor member 5<sup>a'</sup> to swing inwardly to the normal working position as indicated in Fig. 35. The said ribs 55<sup>da</sup> are of sufficient length to form a guide of a fulcrum-like character, so that the rearward end 5<sup>x'</sup> of the extractor member is held rigidly in place, and thus constitutes a holding means,—in the nature of a shank,—for the spring-arm portion 5<sup>aa</sup> of the extractor member. Thus during a swinging movement of the extractor 5<sup>a'</sup> inwardly or outwardly, the draft-plug portion 5<sup>p</sup> slides in the socket 5<sup>r</sup>, and is thus distinguished, as regards its specific operation, from the rotative movement of the draft-plug portion 5<sup>x</sup> of the form of extractor 5<sup>a</sup> as arranged in Figs. 5 to 16; but the hook-end 5<sup>na</sup> moves in a similar manner, and performs a similar function, in each of said arrangements, respectively.

One advantage of the extractor arrangement shown in Figs. 34 and 35, is that, in practice, the draft-plug portion, as 5<sup>p</sup>, may be located well toward the forward end, so that the socket 5<sup>r</sup> may be bored in the block E in a position where this member may normally have a considerable mass of metal, and thus avoid weakening the side-arm 55<sup>da</sup> of the member E when this is of the preferred form herein shown, having the head-portion comprising the face-portion 5<sup>m</sup>, with the large central opening 55<sup>e</sup> between the two side bars 55<sup>da</sup>, 55<sup>e</sup>.

I claim—

1. In an auto-loading firearm, the combination of a frame, a barrel, a breech-block reciprocatably-supported on the frame and having a block-face for supporting a cartridge in firing position in the barrel, a block-operating member reciprocatably longitudinally of the frame, and having a guide-way within which the breech-block is arranged for longitudinal reciprocative movements, a firing-pin carried by the block-operating member, a lockable extractor carried by the breech-block, and two faces in positions and arranged on the block-operating member, one for changing the firing-pin position relatively to the block-face, and the other being an extractor-locking face in position for coacting with the lockable ex-

tractor, each during a reciprocative movement of the breech-block within said guide-way.

2. In an auto-loading firearm, the combination of a frame, a barrel, a breech-block reciprocatably-supported on the frame and having a block-face for supporting a cartridge in firing position in the barrel, a block-operating slide having sidewalls slidably engaging the frame, and provided with inner faces constituting a guide-way within which the breech-block is arranged for longitudinal reciprocative movements, a firing-pin carried by the slide, a lockable shell-extractor carried by the breech-block, and two faces in positions and arranged on the slide, one for changing the firing-pin position relatively to the block-face, and the other for coacting with the lockable extractor, each during a reciprocative movement of the breech-block between said guide-way faces of said slide walls.

3. In a firearm, the combination of a frame, a barrel, a breech-block reciprocatably-supported on the frame and having a block-face for supporting a cartridge in firing position in the barrel, and a block-operating slide having sidewalls slidably engaging the frame and provided with inner faces constituting a guide-way within which the breech-block is arranged for longitudinal reciprocative movements, a firing-pin carried by the slide, a lockable extractor carried by the breech-block and having a hook-end in cooperative relation with said block-face, and two faces located in fixed positions on the slide, one being a positioning face for changing the firing-pin position relatively to the block-face, and the other being a locking face for coacting with the lockable extractor, during a reciprocative movement of the breech-block relatively to the slide.

4. In a firearm, the combination of a frame, a barrel, a breech-block slidable-supported on the frame and having a block-face for supporting a cartridge in firing position in the barrel, an operating slide having therein a breech-block chamber with parallel inner surfaces constituting a guide-way within which the breech-block is arranged for longitudinal reciprocating movements, a firing-pin carried by the slide, and an extractor carried by the breech-block, said slide having in fixed locations thereon, two faces in positions and arranged, respectively, one located transversely of the guide-way for advancing the firing-pin relatively to the block-face, and the other located longitudinally of the guide-way for simultaneously unlocking the extractor from the shell-extracting position thereof during a forward movement of the breech-block relatively to the slide.

5. In a firearm which comprises in combi-

nation, a frame, a barrel, a reciprocable breech-block having a block-face in position for supporting a cartridge in the barrel, and an operating slide having therein a  
 5 breech-block chamber with parallel inner faces constituting a guide-way within which the breech-block is arranged for longitudinal reciprocating movements, the combination with the said slide and the breech-block,  
 10 of a firing-pin appurtenant to the slide, and an extractor operably-supported upon the breech-block, said slide having in fixed locations thereon, two faces in positions and arranged, respectively, one for advancing  
 15 the firing-pin relatively to the block-face, and the other for unlocking the extractor from the shell-extracting position thereof, said faces being also arranged for simultaneous operation during a reciprocative  
 20 movement of the breech-block relatively to the slide.

6. In a firearm which comprises in combination, a frame, a barrel, a breech-block slidably-supported on the frame and having  
 25 a block-face for supporting a cartridge in firing position in the barrel, and an operating slide having therein a breech-block chamber with longitudinal inner faces constituting a guide-way within which the  
 30 breech-block is arranged for longitudinal reciprocating movements, the combination with the said slide and the breech-block, of a firing-pin appurtenant to the slide, and an extractor operably supported upon the  
 35 breech-block, said slide having in fixed locations thereon, two faces in positions and arranged, respectively, one for advancing the firing-pin relatively to the block-face, and the other for unlocking the extractor  
 40 from the shell-extracting position thereof, said faces being also arranged for simultaneous operation during a reciprocative movement of the breech-block relatively to the slide.

7. In a firearm mechanism having a frame and a breechaction retractable on the frame through a loading-stroke from a firing-position, the combination with the frame, of a barrel, a reciprocable block-operating action-member having therein parallel and oppositely disposed plane faces constituting a guide-way for a breech-block; a breech-block guided by said guide-way faces and reciprocable longitudinally of the frame and having  
 55 a block-face for supporting a cartridge in the barrel when the mechanism is in firing-position, and also having parallel plane faces contiguous to and bearing against said parallel plane faces, respectively, of the guide-way; a lockable extractor carried by the breech-block and located in one side face thereof; and a locking-face cooperative with the extractor and located on the said action member contiguous to the extractor side of  
 60 the breech-block, and arranged for the force

of the extractor-locking operation to be transmitted transversely through the breech-block against an oppositely-disposed plane face of the guide-way.

8. In a firearm mechanism having a frame 70 and a breechaction retractable on the frame through a loading-stroke from a firing-position, the combination with the frame, of a barrel, a reciprocable block-operating and block-inclosing slide having therein parallel 75 and oppositely-disposed faces constituting a guide-way for a breech-block; a breech-block guided by said guide-way faces and reciprocable longitudinally of the frame and having a block-face for supporting a cartridge in the barrel when the mechanism is in firing-position, and also having parallel faces contiguous to and bearing against said parallel faces, respectively, of the guide-way, and a lockable extractor carried by the 85 breech-block and located in one side face thereof, and a locking-face cooperative with the extractor and located on the said slide contiguous to the extractor side of the breech-block, and arranged for the force of 90 the extractor-locking action to be transmitted transversely through the breech-block against an oppositely-disposed face of the guide-way.

9. In an auto-loading firearm mechanism 95 having a frame and a breechaction retractable on the frame through a loading-stroke from a firing-position, the combination with the frame, of a barrel, a reciprocable block-operating action-member having therein a 100 guide-way for a longitudinally-reciprocable breech-block; a firing-pin and a positioning face therefor, each appurtenant to the said action-member; a cartridge-actuable breech-block non-rotatably guided in 105 said guide-way and having a block-face for supporting a cartridge in the barrel when the mechanism is in a firing-position; a lockable extractor carried by the breech-block and located on one side thereof; and, a locking-face 110 cooperative with the extractor and located on the said action-member contiguous to the extractor side of the breech-block, and arranged for the force of the extractor-locking operation to be transmitted transversely 115 through the breech-block against an opposing face of the guide-way.

10. In a firearm mechanism having a frame and a breechaction retractable on the frame through a loading-stroke from a firing-position, the combination with the frame, of a barrel, a reciprocable block-operating action-member having therein two parallel and oppositely-disposed plane faces constituting a guide-way for a breech-block; a 125 breech-block located between said guide-way plane faces and reciprocable longitudinally of the frame and within said guide-way, and having a block-face for supporting a cartridge in the barrel when the mechanism is 130

in firing-position, and also having parallel side faces contiguous to and bearing against said parallel plane faces, respectively, of the guide-way; a lockable extractor carried by the breech-block and located on one side thereof; a locking-face cooperative with the extractor and located on the said action-member substantially in the plane of that face of the guide-way which is contiguous to the extractor side of the breech-block, and arranged for the force of the extractor-locking operation to be transmitted transversely through the breech-block against the opposite said plane face of the guide-way, and means appurtenant to the breech-action for limiting the longitudinal movement of the breech-block relatively to the action-member.

11. In a firearm mechanism having a frame and a breechaction retractable on the frame through a loading-stroke from a firing-position; the combination with the frame, of a barrel; a reciprocable block-operating and block-inclosing slide having therein a guide-way with parallel and oppositely-disposed plane faces for guiding a breech-block; a breech-block located between said guide-way plane faces and reciprocatable longitudinally of the frame and within said guide-way, and having a block-face for supporting a cartridge in the barrel when the mechanism is in firing-position, and also having parallel side faces contiguous to and bearing against said parallel plane faces, respectively, of the guide-way; a lockable extractor carried by the breech-block and located on one side thereof; a locking-face cooperative with the extractor and located on said slide substantially in the plane of that face of the guide-way which is contiguous to the extractor side of the breech-block, and arranged for the force of the extractor-locking operation to be transmitted transversely through the breech-block against the opposite said plane face of the guide-way, and means appurtenant to the slide and breech-block for limiting the longitudinal movement of the breech-block relatively to said guide-way faces.

12. In a firearm mechanism having a frame and a breechaction retractable on the frame through a loading-stroke from a firing-position, the combination with the frame, of a barrel, a reciprocable block-operating action-member having therein parallel and oppositely-disposed faces constituting a guide-way for a breech-block; a firing-pin and a positioning face therefor, each appurtenant to the said action-member; a breech-block guided by said guide-way faces and reciprocatable longitudinally of the frame within said guide-way, and having a block-face for supporting a cartridge in the barrel when the mechanism is in firing-position, and also having parallel side faces contiguous to and bearing against said parallel plane faces, respectively, of the guide-way; a lockable extractor carried by the breech-block and lo-

tively, of the guide-way; a lockable extractor carried by the breech-block and located in one side face thereof; a locking-face cooperative with the extractor and located on the said action-member contiguous to the extractor side of the breech-block, and arranged for the force of the extractor-locking operation to be transmitted transversely through the breech-block against an oppositely-disposed face of the guide-way, and means appurtenant to the said action-member for limiting the longitudinal movement of the firing-pin and breech-block relatively to the said action-member.

13. In a firearm mechanism having a frame and a breechaction retractable on the frame through a loading-stroke from a firing-position, the combination with the frame, of a barrel, a reciprocable block-operating and block-inclosing slide having therein parallel and oppositely-disposed faces constituting a guide-way for a breech-block; a firing-pin and a positioning face therefor, each appurtenant to the said action-member; a breech-block guided by said guide-way faces and reciprocatable longitudinally of the frame and having a block-face for supporting a cartridge in the barrel when the mechanism is in firing-position, and also having parallel faces contiguous to and bearing against said parallel faces, respectively, of the guide-way; a lockable extractor carried by the breech-block and located in one side face thereof; a locking-face cooperative with the extractor and located on the said slide contiguous to the extractor side of the breech-block, and arranged for the force of the extractor-locking operation to be transmitted transversely through the breech-block against an oppositely-disposed face of the guide-way, and means appurtenant to the said slide for limiting the longitudinal movement of the firing-pin and breech-block relatively to each other and to the said slide.

14. In a firearm mechanism having a frame and a breechaction retractable on the frame through a loading-stroke from a firing-position, the combination with the frame, of a barrel, a reciprocable block-operating and block-inclosing slide having therein two parallel and oppositely-disposed plane faces constituting a guide-way for a breech-block; a firing-pin and a positioning face therefor, each appurtenant to the said action-member; a breech-block guided by said guide-way faces and reciprocatable longitudinally of the frame within said guide-way, and having a block-face for supporting a cartridge in the barrel when the mechanism is in firing-position, and also having parallel side faces contiguous to and bearing against said parallel plane faces, respectively, of the guide-way; a lockable extractor carried by the breech-block and lo-

5 cated in a recess in one side face thereof; a locking-face cooperative with the extractor and located on the said action-member contiguous to the extractor side of the breech-  
 10 block, and arranged for the force of the extractor locking operation to be transmitted transversely through the breech-block against the opposite said plane face of the  
 15 guide-way, and means appurtenant to the said action-member for limiting the longitudinal movement of the firing-pin and the reciprocation of the breech-block relatively to said slide.

15 15. In a firearm, the combination of a frame, a barrel, a cartridge-actuatable breech-block reciprocatably-supported on the frame and having a block-face for supporting a cartridge in firing position in the  
 20 barrel; a block-operating slide arranged for longitudinal reciprocative movements relatively to the frame and the breech-block; a firing-pin carried by the slide, and a lockable extractor carried by the breech-block and  
 25 having a hook-end in cooperative relation with the block-face, and two faces in positions and arranged on the slide, one for changing the firing-pin position relatively to the block-face and the other for coacting with the lockable extractor during a recip-  
 30 rocative movement of the breech-block relatively to the slide, and a block-advancing actuator-device operative intermediate to the breech-block and the firing-pin, and arranged on the retraction of the slide rear-  
 35 wardly of the power-stroke position thereof, for simultaneously advancing the breech-block to an ineffective position relatively to the firing-pin and locking the extractor in shell-extracting position upon the breech-  
 40 block.

16. In a firearm, the combination of a frame, a barrel, a cartridge-actuatable breech-block reciprocatably-supported on the frame and having a block-face for sup-  
 45 porting a cartridge in firing position in the barrel; a block-operating slide arranged for longitudinal reciprocative movements relatively to the frame and the breech-block, a firing-pin carried by the slide, and a lockable  
 50 extractor carried by the breech-block, and two faces in positions and arranged on the slide, one for changing the firing-pin position relatively to the block-face, and the other for coacting with the lockable ex-  
 55 tractor during a reciprocative movement of the breech-block relatively to the slide, and a spring operative intermediate to the breech-block and the firing-pin.

17. In an auto-ejecting firearm, the combi-  
 60 nation of a frame, a barrel, a non-rotatable breech-block reciprocatably-supported on the frame and having a block-face for supporting a cartridge in firing position in the bar-  
 65 rel, and a block-operating slide arranged for longitudinal reciprocative movements on the

frame, a firing-pin appurtenant to the slide, a lockable extractor operably carried by the breech-block, a firing-pin-positioning face in position on the slide, for changing the firing-pin position relatively to the block-  
 70 face; an extractor-locking device appurtenant to the slide and arranged for locking and unlocking the extractor during the reciprocative movements of the breech-block relatively to the slide, and a block-advancing  
 75 spring in position and arranged for acting at one end thereof against the breech-block by a force resisted and, at the other end thereof by a reactive force transmitted to both slide and the firing-pin.

18. In a firearm, the combination of a frame, a barrel, a breech-block which is cartridge-actuatable through a power-stroke, and is reciprocatably-supported on the frame and arranged for a releasable engagement  
 85 with the frame when at the rearward end of the power-stroke, a lockable shell-extractor carried by the breech-block, a combined block-retracting and extractor-locking slide having an extractor-locking face in position  
 90 and arranged for locking the extractor in the shell-extracting position thereof on the slide being retracted relatively to the breech-block when the block is at the rearward end of the power-stroke; means appurtenant to  
 95 the frame and in position for engaging and thereby blocking the breech-block against rearward movement at the end of the power-stroke and while the slide continues moving rearwardly on the frame, and means appur-  
 100 tant to the slide and arranged for releasing the breech-block from its engagement with said blocking-means of the frame and thereby permit the further retraction of the breech-block immediately after the said lock-  
 105 ing of the extractor and by a further continuance of the rearward movement of the slide on the frame.

19. In a firearm, the combination of a frame, a barrel, a breech-block which is cartridge-actuatable through a power-stroke and is reciprocatably-supported on the frame and arranged for a releasable engagement  
 110 with the frame when at the rearward end of the power-stroke, a lockable shell-extractor carried by the breech-block, a combined block-operating and extractor-locking slide having thereon an extractor-lock arranged for locking the extractor in the shell-  
 115 extracting position thereof on the slide being retracted relatively to the breech-block while this block is at the rearward end of the power-stroke, block-stroke-limiting means appurtenant to the breech-block and frame and comprising a releasable block-  
 120 and-frame engaging means arranged for arresting the rearward movement of the breech-block at the end of the power-stroke, and a combined block-operating and block-retracting means appurtenant to the slide  
 125  
 130  
 135  
 140

and arranged for first releasing said block-and-frame engaging means and then further retracting the breech-block relatively to the frame, and also arranged for effecting said releasing concurrently with the locking of the extractor by said extractor-lock of the slide.

20. In a firearm, the combination of a frame, a barrel, a breech-block which is cartridge-actuatable through a power-stroke and is reciprocatably-supported on the frame and arranged for a releasable engagement with the frame when at the rearward end of the power-stroke, a lockable shell-extractor carried by the breech-block, a combined block-operating and extractor-locking slide having thereon an extractor-lock arranged for locking the extractor in the shell-extracting position thereof on the slide being retracted relatively to the breech-block while this block is at the rearward end of the power-stroke, block-stroke-limiting means appurtenant to the breech-block and frame and arranged for arresting the rearward movement of the breech-block at the end of the power-stroke, and a combined block-operating and block-retracting means appurtenant to the slide and arranged for first releasing the arrested breech-block and then further retracting the breech-block relatively to the frame and also arranged for effecting said releasing concurrently with the locking of the extractor by said extractor-lock of the slide.

21. In a firearm, the combination of a frame, a barrel, a breech-block which is cartridge-actuatable through a power-stroke and is reciprocatably-supported on the frame and arranged for a releasable engagement with a frame-abutment when at the rearward end of the power-stroke, a lockable shell-extractor carried by the breech-block, a combined block-operating and extractor-locking slide having an extractor-locking face in position and arranged for locking the extractor in the shell-extracting position thereof on the slide being retracted relatively to the breech-block while this block is at the rearward end of the power-stroke, means appurtenant to the breech-block and frame for arresting the rearward movement of the breech-block at the end of the power-stroke and while the slide continues moving rearwardly on the frame, and block-operating means appurtenant to the slide and arranged for sliding the breech-block forwardly with relation to the slide, means comprising a stroke-limiting abutment-face on the frame in position for blocking the breech-block against rearward movement at the end of the power-stroke and while the slide continues moving rearwardly on the frame, and means appurtenant to the slide and arranged for lifting the breech-block

out of engagement with said abutment-face and thereby permit the further retraction of the breech-block immediately following the said locking of the extractor by said locking-face of the slide.

22. In a firearm, the combination of a frame, a barrel, a breech-block which is cartridge-actuatable through a power-stroke and is reciprocatably-supported on the frame and arranged for a releasable engagement with a frame-abutment when at the rearward end of the power-stroke, a lockable shell-extractor carried by the breech-block, a combined block-operating and extractor-locking slide having an extractor-locking face in position and arranged for locking the extractor in the shell-extracting position thereof on the slide being retracted relatively to the breech-block while this block is at the rearward end of the power-stroke, means comprising a stroke-limiting abutment face on the frame in position for blocking the breech-block against rearward movement at the end of the power-stroke and while the slide continues moving rearwardly on the frame, and means appurtenant to the slide and arranged for lifting the breech-block out of engagement with said abutment-face and thereby permit the further retraction of the breech-block immediately following the said locking of the extractor by said locking-face of the slide.

23. In a firearm, the combination of a frame, a barrel, a breech-block which is cartridge actuatable through a power-stroke and is reciprocatably-supported on the frame and arranged for a releasable engagement with a frame-abutment when at the rearward end of the power-stroke; a lockable shell-extractor carried by the breech-block; a combined block-operating and extractor-locking slide having a breech-block chamber with longitudinal parallel guide-way faces between which the breech-block is fitted for sliding movements, and also having an extractor-locking face in position and arranged for locking the extractor in the shell-extracting position thereof on the slide being retracted relatively to the breech-block while this block is at the rearward end of the power-stroke; a stroke-limiting abutment on the frame and arranged for arresting the rearward movement of the breech-block at the end of the power-stroke and while the slide continues moving rearwardly on the frame, and block-operating means appurtenant to the slide and arranged for sliding the breech-block upwardly and forwardly between said guideway faces and relatively to the slide during the time immediately following the end of the power-stroke, and thereby releasing the breech-block from said engagement with the frame-abutment and also locking the extractor si-

multaneously with a rearward movement of the slide relatively to the breech-block, and prior to the shell-extracting stroke thereof.

24. In a firearm which comprises a frame, a barrel and a breech-block coöperative with a long-stroke power-slide, and in which said breech-block and slide move together through a rearward power-stroke while the block has a retracted position relatively to the slide, and move together through the rearward part of a forward stroke while the block has an advanced position relatively to the slide, and in which the slide at the end of the power-stroke then moves rearwardly relatively to the breech-block, the combination with the power-slide and the breech-block, of an extractor device operably carried on the breech-block and normally held in working position by a spring, and also provided with a lock-face on the outer side of the hook-end thereof, and two extractor-locking faces separated by a space and located and arranged on the power-slide, one for engaging said lock-face of the extractor during a movement in one direction of the breech-block relatively to the slide, and the other for engaging with said extractor lock-face on a reverse movement of the breech-block relatively to the slide whereby the hook-end of the extractor is locked in the shell-extracting position thereof during the rearward power-stroke, and also when the slide is in the forward position thereof, and whereby the extractor is unlocked during one part of the forward movement of the slide relatively to the breech-block, for thereby permitting the extractor hook to pass over and engage forward of the rim of a cartridge which has been prematurely advanced before or during the loading-in operation.

25. In a firearm which comprises a frame, a barrel and a breech-block coöperative with a long-stroke power-slide, and in which said block and slide move together through a rearward power-stroke while the block has a retracted position relatively to the slide, and move together through the rearward part of a forward stroke while the block has an advanced position relatively to the slide, and in which the slide at the end of the power-stroke then moves rearwardly relatively to the breech-block, the combination with the power-slide and the breech-block, of an extractor operably carried on the breech-block and provided with a shell-engaging hook and with a lock-face on the outer side thereof, and two extractor-locking faces separated by a space and located and arranged on the power-slide, one for engaging said lock-face of the extractor during a movement in one direction of the breech-block relatively to the slide, and the other for engaging with said extractor lock-

face on a reverse movement of the breech-block relatively to the slide, whereby the extractor hook is locked in the shell-extracting position thereof during the rearward power-stroke, and also when the slide is in the forward position thereof, and is unlocked during one part of the forward movement of the slide relatively to the breech-block.

26. In a firearm mechanism, the combination of a frame, a barrel, a retractable breech-block having a block-face in position for holding a cartridge in the barrel when the breech-block is in firing position, the breech-block having in one side thereof and adjacent to said block-face, a radially-located socket; a lockable extractor having a hook in coöperative relation with the block-face and also having a draft-plug engaging in said socket and operable therein in a direction radially of the breech-block; and a reciprocable extractor-lock located in the mechanism for operating upon the extractor in a direction for sliding said draft-plug into said socket and thereby positively holding the extractor hook in shell-extracting position.

27. In a firearm mechanism, the combination of a frame, a barrel, a retractable breech-block having a block-face in position for holding a cartridge in the barrel when the breech-block is in firing position, and having in one side thereof and adjacent to said block-face, a radially-located socket; a lockable extractor having a hook in coöperative relation with the block-face and also having a draft-plug engaging in said socket and operable therein in a direction radially of the breech-block; and a reciprocable extractor-lock located in the mechanism for operating upon the extractor in a direction for sliding said draft-plug into said socket and thereby positively holding the extractor hook in shell-extracting position, and an extractor-carrying spring-arm appurtenant to the extractor and engaging the breech-block for thereby yieldingly holding the extractor with the hook thereof in shell-extracting position and normally holding the draft-plug in said socket.

28. In a firearm mechanism, the combination of a frame, a barrel, a breech-block reciprocably-supported on the frame and having a block-face for supporting a cartridge in firing position in the barrel, and having in one side thereof and adjacent to said block-face, a radially-located socket; a lockable extractor having a hook in coöperative relation with the block-face and also having a draft-plug engaging in said socket and operable therein in a direction radially of the breech-block; an operating slide having therein a guideway within which the breech-block is arranged for lon-

itudinal reciprocating movements, and an extractor-lock in position and arranged on the slide for operating upon the extractor in a direction for sliding said draft-plug into said socket and longitudinally of the draft-surface thereof, during a longitudinal movement of the slide relatively to the breech-block.

29. In an auto-extracting firearm, the combination of a frame, a barrel, a breech-block reciprocatably-supported on the frame and having a block-face for supporting a cartridge in firing position in the barrel, and also having adjacent to the block-face a transversely-located socket; a block-operating member slidably engaging the frame, and having a guide-way within which the breech-block is arranged for longitudinal reciprocative movements; a lockable extractor carried by the breech-block and having a draft-plug operably-engaging in said socket of the breech-block, and an extractor-actuating locking device in position and arranged on the block-operating member for locking and unlocking the extractor during the reciprocative movements of the breech-block within said guide-way.

30. In an auto-extracting firearm the combination of a frame, a barrel, a breech-block reciprocatably-supported on the frame and having a block-face for supporting a cartridge in firing position in the barrel, and also having adjacent to the block-face a transversely and radially located socket; a block-operating member slidably engaging the frame, and having a guide-way within which the breech-block is arranged for longitudinal reciprocative movements; a lockable extractor carried by the breech-block and having a draft-plug operably and slidably engaging in said socket of the breech-block, and an extractor-actuating locking device in position and arranged on the block-operating member for locking and unlocking the extractor during the reciprocative movements of the breech-block within said guide-way.

31. In an auto-ejecting firearm which comprises a frame, a barrel, a reciprocatable breech-block and a long-stroke reciprocatable power-slide, the combination with the power-slide and the breech-block, of an extractor device operably carried on the breech-block and normally held in the shell-extracting position thereof by a spring, and also provided with a lock-face, and two locking-faces located and arranged on the outer side of the power-slide, one for engaging said lock-face of the extractor during a movement in one direction of the breech-block relatively to the slide, and the other for engaging with said extractor lock-face by a reverse movement of the breech-block relatively to the slide.

32. In a firearm mechanism, the combination of a frame, a barrel, a breech-block reciprocatably-supported on the frame and having a block-face for supporting a cartridge in firing position in the barrel, and having in one side thereof and adjacent to said block-face, a radially-located socket for the draft-plug of an extractor; a lockable extractor having a hook in cooperative relation with the block-face and also having a draft-plug engaging in said socket and operable therein in a direction radially of the breech-block; an operating slide having therein a guide-way within which the breech-block is arranged for longitudinal reciprocating movements; an extractor-lock in position and arranged on the slide for operating upon the extractor in a direction for sliding said draft-plug into said socket and longitudinally of the draft-surface thereof during a longitudinal movement of the slide relatively to the breech-block; and, a spring engaging the breech-block and arranged for yieldingly holding the extractor with the hook thereof in shell-extracting position.

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Witnesses:

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