C. J. EHBETS.

SAFETY DEVICE FOR FIREARMS.

APPLICATION FILED NOV. 14, 1907.

917,723.

Patented Apr. 6, 1909.

Fig. 2.

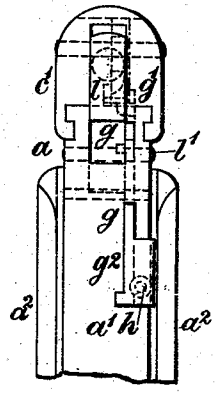


Fig. 1.

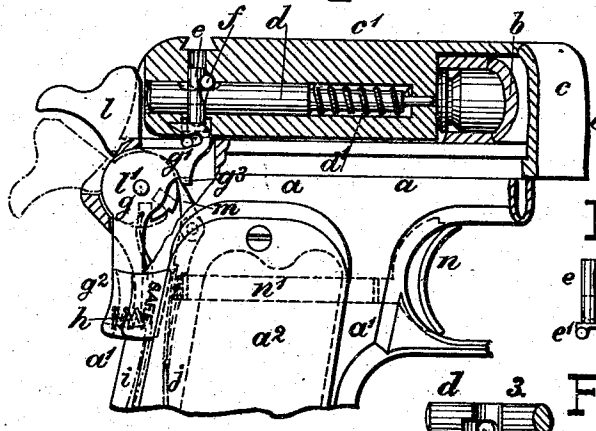


Fig. 3.

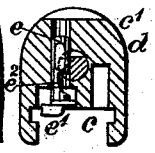


Fig. 7.

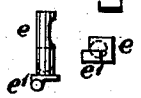


Fig. 6.

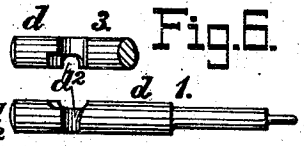


Fig. 5.

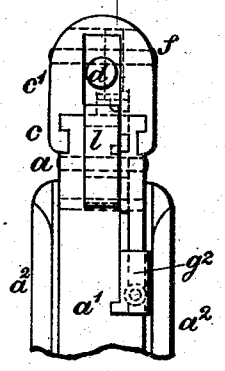


Fig. 4.

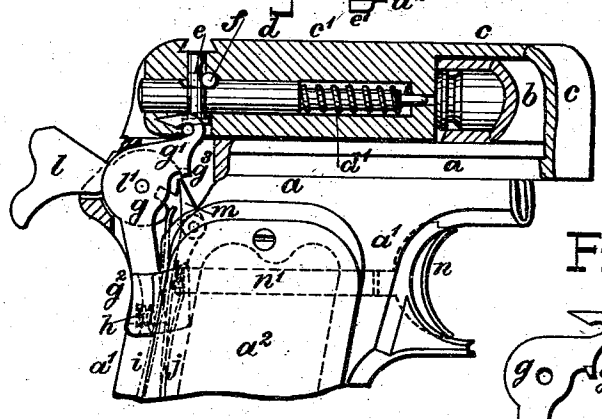
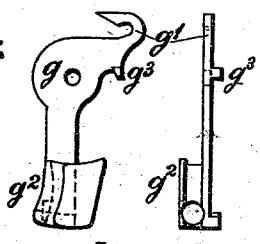


Fig. 8.



Witnesses.

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UNITED STATES PATENT OFFICE.

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SAFETY DEVICE FOR FIREARMS.

No. 917,723. Specification of Letters Patent. Patented April 6, 1909.

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To all whom it may concern:

Be it known that I, CARL J. EHBETS, a citizen of the United States, residing at Hartford, county of Hartford, and State of Connecticut, have invented certain new and useful Improvements in Safety Devices for Firearms, of which the following is a specification, reference being had to the accompanying drawings, forming a part hereof.

This invention relates to breech-loading firearms, and particularly to breech-loading firearms of that class in which the breech of the barrel is opened and closed by the movements in the frame from and to the barrel of a breech-bolt, and in which the parts of the firing-mechanism are secured in the frame below and at the rear of the breech-bolt, while a firing-pin or striker, movably seated in the breech-bolt, serves to transmit the igniting blow from the firing-mechanism to the primer of the cartridge in the chamber of the barrel, when the breech is closed and the firing-mechanism is operated for firing a shot.

The main object of this invention is to provide the firearm with a simple but reliable safety device for positively preventing the occurrence of the dangerous unintentional or accidental firing liable to result from careless handling or drawing of a firearm, and from dropping the arm, when on falling it should strike upon an exposed part of the firing-mechanism, such as the hammer or the rear end of the firing-pin, so as to drive the same forward into contact with the primer of the cartridge.

Another object of this invention is to positively prevent contact of the firing-pin with the primer at all times, except when the firearm is grasped and raised, as in the act of aiming it preparatory to firing; so as to prevent accidental firing which might result, even though the firing-mechanism is locked, if the arm should be dropped and strike endwise upon the muzzle of the barrel with sufficient force to carry the firing-pin by its momentum into contact with the primer of the cartridge.

A further object of the invention is to so construct the safety device that it shall operate automatically and positively to make the discharge of the firearm impossible, except when the hammer has been cocked and the arm is grasped and raised, and the trigger is operated; at all other times the safety device, without requiring attention, shall be moved to positively prevent the firing of the arm, even in case violent blows were struck either upon the hammer or upon the muzzle of the barrel.

I attain all of these objects by improved automatic safety devices, which, when combined, in the operative position positively lock the sear against movement at the point by which the sear holds the hammer in cocked position, thereby making release of the hammer impossible; and at the same time positively withdraw the firing-pin into the breech-bolt and lock it therein in a position in which its forward firing-point does not project from the face of the breech-bolt and, therefore, cannot make contact with the cartridge in front of the same, while the rear end of the firing-pin also is within the breech-bolt and does not project from the same, so that, even should the hammer fall, it could not strike the firing-pin, but its blow would be received and supported by the rear end of the breech-bolt, without effect on the firing-pin.

Either the firing-pin locking device or the sear locking device may be used independently of the other, in which case either of them will perform its single function; but if it is desired to attain in a single firearm all of the objects above enumerated, the firing-pin locking and sear locking devices are combined in one.

This combined sear locking and firing-pin locking device consists in mechanism of simple and reliable construction, not liable to get out of order, hereinafter fully described and claimed and illustrated in the accompanying drawings.

The invention is shown herein embodied in a recoil-operated magazine-pistol, but it will be understood that the invention is applicable to other firearms, therefore it is not intended to restrict the present invention to use in magazine-pistols, nor in any particular kind of firearms, nor even to the combination of the several features of improvements in a single structure.

In the accompanying drawings: Figure 1 represents a side elevation of the rear por-

tion of a well-known Colt automatic magazine-pistol, partly in longitudinal vertical section, with the breech closed and the hammer down, and the sear and the firing-pin positively locked against movement. Fig. 2 represents a rear end view of the same, with the parts in the same position as in Fig. 1. Fig. 3 represents a vertical transverse section through the breech-bolt in the plane of the axis of the vertical firing-pin locking-bolt, as seen from the front. Fig. 4 represents a side elevation partly in longitudinal section, similar to Fig. 1, but with the hammer cocked and the sear and firing-pin released, as by a grasp upon the grip of the pistol, and ready for operation by a pull upon the trigger. Fig. 5 represents a rear end view of the same, similar to Fig. 2, but with the parts in the same position as in Fig. 4. Fig. 6 represents the firing-pin detached, respectively at 1 in a side elevation, at 2 in a transverse section with the locking-bolt in the raised released position, and at 3 in a top-view of the rear portion of the firing-pin. Fig. 7 shows the locking-bolt detached, respectively in a side elevation and in a bottom-view. Fig. 8 represents the grip-lever detached, in a side elevation and in a front elevation.

Similar characters refer to similar parts throughout the several views.

In the pistol represented in the drawings the barrel *b* is supported upon the frame *a*, and on top of the frame the breech-slide *c* is fitted to slide rearward and forward, the sides of the breech-slide overlapping the frame and interlocking-ribs and grooves on slide and frame holding the breech-slide to the frame and guiding it thereon. The rear part of the breech-slide *c* forms the breech-bolt c^1, adapted to close the chamber of the barrel, and the forward part of the breech-slide *c* extends in semi-tubular form and incloses the barrel. On firing a shot, the breech-slide and barrel recoil a short distance together, then the barrel becomes disengaged from the breech-slide and the movement of the barrel is arrested, while the breech-slide continues to recoil, thus opening the breech, after which the breech-slide is returned forward by a reaction-spring in the usual manner and is interlocked with the barrel, thus closing the breech.

The frame *a* and the breech-slide *c* in rear of the barrel form the receiver and an opening is provided for the ejection of the cartridge-shells, the breech-bolt carries a firing-pin and an extractor, while an ejector is provided in the receiver. The frame has the grip or handle a^1 below the receiver, and the hammer *l* and the sear *m* are pivotally fitted in the frame in rear of the grip, while the trigger *n* is located in front of the grip and has a rearward extension n^1 connecting it with the lower end of the sear. The main-spring *i* and the combined sear- and trigger-spring *j* are arranged in the rear portion of the grip a^1.

Cartridges may be supplied by the usual cartridge-magazine in which a column of cartridges is carried upon a spring-follower, by which the topmost cartridge is presented in front of the breech-bolt when the same is in the open rear position, so that by the closing movement of the breech-bolt the cartridge is transferred to the chamber of the barrel.

All the parts thus far referred to are of the same construction and mode of operation as those of the well-known Colt automatic pistol, and forming no part of the present invention, require no further description or illustration herein, except as far as certain features will be referred to hereinafter.

When a pistol is carried with the expectation that its use will be required, for offense or defense, and that the occasion for its use may arise suddenly at very short notice, it is important, in order that the pistol may be ready for instant use, to have it charged and placed in a condition in which it requires for effective use, no action or thought but the grasping, aiming and firing by pulling the trigger.

An automatic pistol such as here described and represented, requires, in order to be thus prepared, that it be provided with a loaded magazine, and that a cartridge be inserted in the chamber of the barrel and the hammer be cocked, either directly by hand, or by once drawing the breech-slide to the rear and releasing it, thereby cocking the hammer and feeding one cartridge to the barrel. The arm is then ready for firing a number of shots in rapid succession, requiring only a pull of the trigger for each shot. To enable the pistol to be carried thus loaded and cocked with absolute safety, I provide it with the combined sear and firing-pin locking device, which comprises the grip-lever *g* and the firing-pin locking-bolt *e*.

The firing-pin *d*, of usual form and carried loosely in the central seat of the breech-bolt c^1 is in length slightly shorter than the breech-bolt, as seen in Fig. 1. In rear of the forward firing-point, the firing-pin is reduced in diameter and carries the usual retraction-spring d^1 which serves to move the firing-pin to the rear so as to expose the projecting rear end of the same to receive the blow of the hammer whenever the firing-pin is not locked in the safe non-projecting position. The usual transverse pin *f*, fitted in the breech-bolt between two shoulders formed by a cut in the top of the firing-pin, serves to limit the rearward movement of the same. In rear of this cross-pin *f*, the firing-pin locking-bolt *e* is loosely seated vertically in the breech-bolt, so as to be limited in its upward and downward movements by the cross-pin *f* and the two shoulders formed by a cut in the forward side

of the locking-bolt *e*, Figs. 1 and 4. The vertical seat of the locking-bolt *e* is so located in the breech-bolt that it intersects the seat of the firing-pin on the right-hand side, and, as best seen in Figs. 3 and 6, the firing-pin *d* has in its side a vertical semi-circular recess d^2 for the reception of the locking-bolt *e*. The upper portion of the locking-bolt *e* is cylindrical, and when the locking-bolt *e* is in the lowered operative position, as in Figs. 1, 2 and 3, this cylindrical portion occupies the recess d^2 in the side of the firing-pin and positively locks the firing-pin against movement, both in the forward and rearward direction. Below the cylindrical portion the locking-bolt has a recess e^2 on its inner left-hand side, the lower part of this recess is quadri-circular and of a diameter corresponding with that of the firing-pin, the upper edge of this recess e^2 in the locking-bolt *e*, however, is rectilinear and horizontal and corresponds with the top surface of the firing-pin *d* in rear of the recess, which is straight and horizontal, formed by a cut in the top of the firing-pin running a short distance rearward from the recess d^2 in the same. By this construction a comparatively short vertical movement of the locking-pin *e* carries the straight upper edge of the recess d^2 in the same below the upper straight edge of the recess d^2 in the firing-pin *d* and locks the same at the largest central portion of its cross-section, as shown in Figs. 2 and 3; whereas, if the recess in the locking-bolt were semi-circular, and the firing-pin not flattened, the same movement would interlock only much weaker semi-lunar upper portions.

When the locking-bolt *e* is raised, so as to bring the upper straight edge of its recess e^2 in line with the straight rear edge of the top of the firing-pin *d* in rear of the recess d^2, as best shown in Fig. 6 at 2, the locking-bolt *e* releases the firing-pin, and, under the tension of the retraction-spring d^1, the firing-pin is moved rearward entering the recess e^2 in the locking-bolt *e*, so as to project from the breech-bolt at the rear, Fig. 4, where the hammer can strike the firing-pin and force it to impinge upon the primer of the cartridge in the barrel, after which the spring d^1 again forces the firing-pin to the rear, the rearward movement of the same, while released, being limited by the cross-pin *f*; as best seen in Figs. 1, and 6 at 1, the upper portion of the forward side of the recess d^2 in the firing-pin *d*, instead of being vertical is slanting and forms a cam-surface, inclining downward and rearward, and when the locking-bolt *e* has been raised and the released firing-pin has been moved to the rear, the upper forward edge of this inclined cam-shaped part of the recess d^2 stands beneath the forward edge of the cylindrical part of the locking-bolt *e* above the recess e^2 in the same; if now the locking-bolt *e* is forced downward it acts upon the inclined cam-surface and forces the firing-pin forward, moving it from the rearmost position shown in Fig. 4 to the position shown in Fig. 1, where both ends of the firing-pin are within the breech-bolt, in which position the locking-bolt *e* securely locks the firing-pin *d*.

For actuating the locking-bolt *e*, the grip-lever *g* is provided. The grip-lever *g* is fitted in a recess in the frame of the pistol, at the right-hand side of the hammer, the hub of the lever *g* corresponding with the hammer-hub and the hammer-pivot l^1 serving also as pivot for the lever *g*. From the hub downward the lever *g* extends within the grip, and, at a short distance below the hammer, this lower arm of the grip-lever *g* projects from a slot in the rear of the grip a^1, and is provided at its lower portion with a wider handle g^3 which is rounded to correspond with the rear face of the grip and extends laterally to the right-hand side of the same, and has a flat web fitted to freely slide upon the side of the grip, the forward edge of said web extending into a recess in the wooden stock a^2, fastened to the side of the grip. The lever *g* has a limited vibratory movement upon the pivot l^1, and a spring *h*, the rear end of which is seated in a recess in the lever *g* near its lower extremity, while the forward end of the spring is supported by a shoulder in the side of the grip, serves to yieldingly keep the lower arm of the lever *g* in the rear position, in which the lever projects some distance from the rear of the grip a^1, as shown in Fig. 1. If pressure is exerted upon the lever-arm, as by the hand in grasping the grip, the lever-arm is pressed forward into the grip until it does not project from the same, but corresponds with the rear surface of the grip, as shown in Fig. 4. Above the pivot the lever *g* is provided with a projecting upper arm g^1 which extends forward and upward from the lever-hub in shape of a hook, see Fig. 8, having a small inclined slot open to the rear, and over the same sloping upward and rearward to a point. With the lever *g* in its place in the frame, the top of the upper lever arm g^1 projects above the top of the frame into a longitudinal groove in the bottom of the breech-bolt 8.

At the lower end the locking-bolt *e* is provided with a rectangular head fitted in a corresponding recess in the breech-bolt, by which the locking-bolt is kept from turning on its axis, and below this head the locking-bolt carries a short extension, see Figs. 3 and 7, from which a small cylindrical stud e^1 projects laterally and horizontally into the groove in the bottom of the breech-bolt, and into the small slot in the upper arm of the lever *g*, in which the stud e^1 freely fits.

With the breech-bolt in the forward closed position and with the grip-lever *g* projecting from the rear of the grip, as shown in Fig. 1,

the stud e^1 occupies the rear portion of the inclined slot in the upper lever-arm, and thereby the locking-bolt e is held in its lower operative position in which it locks the firing-pin in the safe non-projecting position.

When the lower lever-arm is pressed into the grip, as by the hand grasping the grip, as shown in Fig. 4, the upper arm g^1 of the lever swings upward and carries up the stud e^1 and thereby raises the locking-bolt e, so as to release the firing-pin and allow it to be moved rearward into the reach of the hammer by the spring d^1. If now the trigger is pulled to release the hammer, the same will strike the released firing-pin and cause a shot to be fired. Under the energy of recoil the breech-bolt will move to the rear and will be at once returned forward by the reaction-spring. At the first of the recoil, the stud e^1, carried rearward by the breech-bolt, will move in the slot in the upper arm of the lever g, see Fig. 4, and by the inclination of the slot the stud will be forced down so as to draw down the locking-bolt e and thereby move the firing-pin to the safe position and there lock it, after which the continued recoil of the breech-bolt will carry the locking-bolt and the stud rearward away from the lever g. During the last of the return or closing movement of the breech-bolt the stud e^1 reenters the slot in the upper arm of the lever g, the slope below the point at the top of the lever in rear of the slot insuring the entrance of the stud e^1 into the slot, whereby the locking-bolt e is again held down and the firing-pin locked in the safe position, if the grip-lever should have been released and moved to the safe position, as shown in Fig. 1, after the shot was fired and before the breech-bolt was returned forward. If on firing a shot, the grip-lever is kept continuously within the grip, in the position shown in Fig. 4, the return forward of the breech-bolt will cause the stud e^1, in entering the slot in the top of the lever, first to be forced down and then to be raised, so that the firing-pin will be unlocked and ready for continued firing when the breech is fully closed, as long as the grasp on the grip is not released. As may be seen in Fig. 1, this positive locking of the firing-pin, before the breech is fully closed, will take place if the grip-lever stands in its operative projecting position, even in case the locking-bolt e should have been raised to release the firing-pin while the breech-bolt was moving to and from or kept in the rear position, though there is nothing in the normal operation of the mechanism of the arm to raise the locking-bolt while it is away from the control of the grip-lever.

In front of the hub and below the upper arm g^1, the grip-lever g has a forward extension, located above and at the side of the point of the sear m by which the sear keeps the hammer l in the cocked position; as best shown in Fig. 8, on the inner side of this extension, toward the sear, a small projecting stud g^3 is provided on the grip-lever g. When the grip-lever is in the operative position in which it locks the firing-pin, as shown in Fig. 1, this stud g^3 stands in front of the sear-point, both when the hammer is cocked or when the hammer is down, see Figs. 1 and 4, and the stud g^3 thus locks the sear against movement. When the hammer is being cocked the eccentric hammer-hub above the cock-notch presses the inclined front side of the sear-point outward against the tapering inner edge of the projection g^3 on the lever g, and thereby forces the lever to move with the hammer, to the non-operative position, until the sear-point enters the cock-notch of the hammer, then the lever g is moved by the spring h out of the grip and the projection g^3 of the lever descends in front of the sear-point and positively locks the sear against movement to release the hammer, and thereby locks the hammer in the cocked position; and, as the rearward extension n^1 of the trigger stands in front of the lower end of the sear, the lever g by locking the sear, also locks the trigger against movement. Thus the grip-lever g, in its operative position, automatically and positively locks the firing-pin and also locks every member of the firing-mechanism. When the grip-lever is pressed into the grip, as by a grasp upon the same, see Fig. 4, the stud g^3 is raised out of the path of the sear-point, so as to release the sear, which may then be moved by pressure against the trigger to release the cocked hammer, while, at the same time, the grip-lever releases the firing-pin.

To indicate that the pistol is safely locked against firing, the word "safe" is engraved on the side of the handle of the grip-lever so as to be in plain view when the grip-lever projects from the grip, as shown in Fig. 1; when the grip-lever is pressed into the grip, this word is covered by the stock of the pistol, as shown in Fig. 4. The projecting position of the grip-lever, easily perceptible to the touch as well as at a glance, serves in the dark as well as in the light to indicate that the pistol is safely locked.

It will be understood that the devices hereinbefore described may also be applied in firearms having no pivoted hammer, but in which the firing-pin itself serves as striker or hammer and is held cocked and released by the sear in the manner well-known.

What I claim and desire to secure by Letters Patent is:

1. In a breech-loading firearm, the combination of a breech-bolt, a firing-pin mounted therein, a pivoted hammer, a longitudinally movable locking device carried by said breech-bolt to hold the firing-pin in safe position, and means to shift the locking device

from locking position to unlocking position and from unlocking position to locking position.

2. In a breech-loading firearm, the combination of a breech-bolt, a firing-pin mounted therein, a pivoted hammer, a locking device carried by said breech-bolt to hold the firing-pin in safe position, and means manually operated to shift the locking device from locking position to unlocking position, and automatically operated to shift the locking device from unlocking position to locking position.

3. In a breech-loading firearm, the combination of a breech-bolt, a firing-pin mounted therein and shorter than the breech-bolt, a pivoted hammer, a locking-bolt to hold the firing-pin with its forward end withdrawn from the cartridge, and means to shift the locking device from locking position to unlocking position and from unlocking position to locking position.

4. In a breech-loading firearm, the combination of a breech-bolt, a firing-pin mounted therein and shorter than the breech-bolt, a pivoted hammer, a locking-bolt to hold the firing-pin with its rear end forward of the rear end of the breech-bolt, and means to shift the locking device from locking position to unlocking position and from unlocking position to locking position.

5. In a breech-loading firearm, the combination of a breech-bolt, a firing-pin mounted therein, a pivoted hammer, a locking-bolt carried by said breech-bolt to hold the firing-pin in safe position, and a grip-lever coöperating with the locking-bolt to shift it from locking position to unlocking position and from unlocking position to locking position.

6. In a breech-loading firearm, the combination of a breech-bolt, a firing-pin mounted therein and shorter than the breech-bolt, a locking-bolt to hold the firing-pin with its forward end withdrawn from the cartridge, and a grip-lever coöperating with the locking-bolt to shift it from locking position to unlocking position and from unlocking position to locking position.

7. In a breech-loading firearm, the combination of a breech-bolt, a firing-pin mounted therein and shorter than the breech-bolt, a locking-bolt to hold the firing-pin with its rear end forward of the rear end of the breech-bolt, and a grip-lever coöperating with the locking-bolt to shift it from locking position to unlocking position and from unlocking position to locking position.

8. In a breech-loading firearm, the combination of a breech-bolt, a notched firing-pin mounted therein, a pivoted hammer, a notched locking-bolt carried by said breech-bolt to coöperate with the longitudinally movable notched firing-pin, and means to shift the locking-bolt from locking position to unlocking position and from unlocking position to locking position.

9. In a breech-loading firearm, the combination of a breech-bolt, a notched firing-pin mounted therein, a notched locking-bolt to coöperate with the notched firing-pin, and a grip-lever coöperating with the locking-bolt to shift it from locking position to unlocking position and from unlocking position to locking position.

10. In a breech-loading firearm, the combination of a breech-bolt, a firing-pin mounted therein and having a notch in one side with a shoulder at one side thereof, a locking-bolt coöperating with the firing-pin and having a quadri-circular notch with a shoulder, and means to shift the locking-bolt from locking position to unlocking position and from unlocking position to locking position.

11. In a breech-loading firearm, the combination of a breech-bolt, a firing-pin mounted therein and having a notch in one side with a shoulder at one side thereof, a locking-bolt coöperating with the firing-pin and having a quadri-circular notch with a shoulder, and a grip-lever coöperating with the locking-bolt to shift it from locking position to unlocking position and from unlocking position to locking position.

12. In a breech-loading firearm, the combination of a breech-bolt, a firing-pin mounted therein and having a notch with a cam-like forward edge, a locking-bolt to coöperate with the notched firing-pin and having a shoulder to coöperate with the cam-like edge of the notch, and means to shift the locking-bolt from locking position to unlocking position and from unlocking position to locking position.

13. In a breech-loading firearm, the combination of a frame, a breech-bolt, a firing-pin mounted therein, a locking-bolt to hold the firing-pin in safe position and having a lug or projection, and a grip-lever pivoted in the frame and having a cam-slot to coöperate with the lug or projection of the locking-bolt.

14. In a breech-loading firearm, the combination of a frame, a reciprocating breech-bolt, a firing-pin mounted therein, a vertically movable locking-bolt mounted in the breech-bolt to hold the firing-pin in safe position and having a lug or projection, and a grip-lever pivoted in the frame and having a rearwardly opening cam-slot to coöperate with the lug or projection of the locking bolt.

15. In a breech-loading firearm, the combination of a frame, a hammer pivoted in the frame, a trigger, a sear, a trigger-sear connection, and a grip-lever pivoted concentrically with the hammer and having a tapering lug or projection to stand in the path of the inclined sear-point.

16. In a breech-loading firearm, the combination of a frame, a hammer pivoted in the frame and having an eccentric hub with a cock-notch, a trigger, a sear, a trigger-sear connection, and a grip-lever pivoted concen-

trically with the hammer and having a tapering lug or projection to stand in the path of the inclined sear-point.

17. In a breech-loading firearm, the combination of a frame, a breech-bolt, a firing-pin mounted therein, a locking-bolt to hold the firing-pin in safe position, a hammer pivoted in the frame, a trigger, a sear, a trigger-sear connection, and a grip-lever coöperating with the locking-bolt to shift it from locking position to unlocking position and from unlocking position to locking position, and cooperating with the sear to hold it from disengagement from the hammer.

This specification signed and witnessed this 11th day of November, A. D. 1907.

CARL J. EHBETS.

In the presence of—
A. L. ULRICH,
K. POWERS.