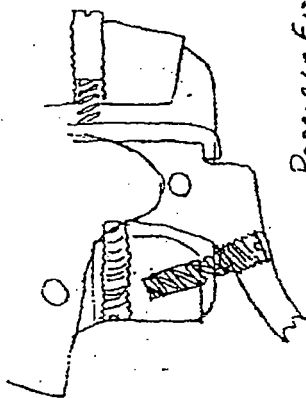


Safety In
Fire
Position

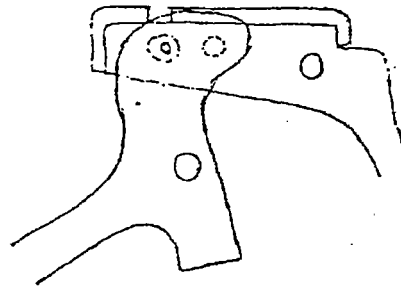
March 10-5-89



Possible External
Adjustment

March 10-5-89

Design #3
Modified Model 700 with Trigger Block



Safety In
On Safe
Position
March 10-5-89
FILED M/L

Butler
EXHIBIT NO. 10
Peggy Rauso

Patented Feb. 9, 1937

2,069,887

UNITED STATES PATENT OFFICE

2,069,887

SEAR-MECHANISM FOR FIREARMS

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Application July 21, 1935, Serial No. 33,357

16 Claims. (Cl. 42--59)

This invention relates to an improvement in firearms and relates in particular to sear-mechanisms therefor.

One of the objects of the present invention is to provide a sear-mechanism for firearms which is characterized by superior reliability.

Another object is to provide a superior sear-mechanism especially adapted for up-turn-and-pullback bolt-action firearms.

A further object is to produce a superior sear-mechanism for firearms which will provide for a substantially-uniform trigger-pull.

A still further object is to provide a bolt-action rearm in which uniformity of trigger-pull is insured, despite variations in the speed at which the bolt thereof is closed.

With the above and other objects in view, as will appear to those skilled in the art from the following, considered in conjunction with the accompanying drawings and appended claims, the present invention includes all features disclosed herein which are novel over the prior art.

In the accompanying drawings:

Fig. 1 is a broken view in side elevation of an upturn-and-pullback bolt-action firearm embodying the present invention, with the stock and associated parts omitted;

Fig. 2 is an under-side view thereof;

Fig. 3 is a vertical central-longitudinal sectional view thereof, with the parts shown in the positions which they assume when the firearm is cocked;

Fig. 4 is a transverse sectional view taken on a line 4-4 of Fig. 3;

Fig. 5 is a view similar to Fig. 3, but showing the parts in the positions which they assume immediately after the firearm is fired;

Fig. 6 is a similar view, but showing the parts in the positions which they assume after the firearm has been fired and the bolt-operating handle has been upturned, preparatory to the retraction of the bolt;

Fig. 7 is a transverse sectional view taken on a line 7-7 of Fig. 6;

Fig. 8 is a perspective view of the sear; and

Fig. 9 is a perspective view of the bolt-operating handle.

The particular firearm herein chosen for the illustration of the present invention is of the so-called "upturn-and-pullback bolt-action" type, and includes a receiver 20 of substantially-cylindrical form having a transverse dovetail receiving groove 21 in its upper rear portion and a firing threaded into its forward end and the rear end of a barrel 22 having a cartridge-chamber 23

therein. The receiver 20 is also provided with an axial bolt-receiving passage 24, the forward upper portion of which is intersected by a loading-and-ejection opening 25.

Mounted in the bolt-receiving passage 24 of the receiver 20, with capacity for reciprocation therein, is a cylindrical bolt 26 having an axial firing-pin passage 27 therein intersected at its forward end by a relatively-small eccentric passage 28. Projectable through the said passage 28 is the firing-point 29 of a firing-plunger 30 mounted in the passage 27 in the bolt 26.

The rear portion of the firing-plunger 30 is of tubular form in cross-section and provides a firing-spring chamber 31 receiving a firing-spring 32, which latter thrusts at its forward end against the front wall 33 of the firing-spring chamber 31. The rear end of the firing-spring 32 is seated against a pin 34 mounted in and extending transversely through the reduced cylindrical rear portion 35 of the bolt 26. The said pin extends through longitudinal clearance-slots 36-38 respectively formed in the rear portion of the top and bottom walls of the firing-plunger 30 so that the said firing-plunger may reciprocate independently of the bolt 26 but, at the same time, be prevented from relative rotary movement with respect thereto.

As shown, the rear end of the firing-plunger 30 may be provided with a head 39 having forwardly-extending ribs 32-33 adapted to enter complementary notches 32-33 in the rear edge of a bolt-operating sleeve 40 which is mounted with capacity for turning movement upon the reduced cylindrical rear portion 35 of the bolt 26 and provided with an integral laterally-offsetting handle 41 terminating in a ball-grip 42.

Intermediate its respective opposite ends, the under-portion of the firing-plunger 30 is transversely cut away to provide a substantially-vertical forwardly-facing cocking-shoulder 43 adapted to be engaged, when the firearm is cocked, by the rear face 44 of a sear-nose 45 vertically upstanding from a pivotal sear 46. The said sear is pivotally mounted adjacent its forward end by means of a transverse pivot-pin 47, in a vertically-extending passage 48 formed in the under side of the receiver 20. The said sear-nose 45 of the sear 46 projects upwardly for the engagement of its rear face 44 with the cocking-shoulder 43, through a longitudinal clearance-slot 49 formed in the under side of the bolt 26.

The portion of the sear 46 which is located forwardly of the pin 47 is provided with an upwardly-opening spring-pocket 50 receiving a sear-spring 55

51 bearing at its upper end against the under surface of the receiver 28 and exerting a constant effort to swing the said seat in a clockwise direction to lift its rear-dose 46. The seat 46 is also formed with a vertical passage 52 receiving the upper end 53 of a trigger 54 and is provided just to the rear of the said passage 52 with a downwardly-feeding trigger-engaging shoulder 55 adapted to rest, when the firearm is cocked, upon an upwardly-leading seat-engaging shoulder 56 formed upon the trigger 54 before referred to.

To limit the degree of overlap of the trigger-engaging shoulder 55 and the seat-engaging shoulder 56, the upper portion of the said trigger 54 is provided with an inclined actuating-screw 57, the rear terminal of which is engageable with the rear wall 58 of the passage 52 in the seat 46 for the purpose just referred to.

The rear portion of the seat 46 is formed with an upwardly-opening pocket 59 receiving a seat-actuating plunger 60 having a stem 61 downwardly-extending through a bearing-passageway 62 opening downwardly through the seat 46 from the lower end of the said pocket 59 therethrough. The stem 61 of the seat-actuating plunger 60 is enclosed by a seat-actuating spring 63 housed in the pocket 59 of the seat 46 and exerting a constant effort to move the plunger 60 upwardly with certain conditions as will hereinafter appear, to depress the rear end of the said seat.

The upper terminal of the seat-actuating plunger 60 is adapted to engage, when the bolt 25 is in its closed position, with a detent-notch 64 formed in the bolt-operating sleeve 48 before referred to, as shown in Figs. 3 and 4 of the drawing. The upper end of the said plunger 60 is also adapted, when the bolt-operating handle 1 is in its elevated position, 64 indicated in Figs. 6 and 7, to engage with a cam-surface 65 also formed upon the exterior surface of the bolt-operating sleeve 48. Under the conditions just described, the upward movement of the seat-actuating plunger 60 with respect to the seat 46 is limited by a stop-pin 66 extending transversely through the stem 61 of the said plunger and engageable for the purpose described with the under face of the adjacent portion of the seat 46, as illustrated in Fig. 6.

The trigger 54 before described is pivoted in intermediate its upper end 53 and its finger-piece 57 by means of a pivot-pin 68 extending transversely thereof and mounted at its respective opposite ends in complementary fingers 69—69 depending from a trigger-bracket 70. The said trigger-bracket is of substantially U-shaped form in horizontal section, as indicated in Fig. 3, and has its respective opposite side walls 71—71, from which the fingers 69—69 depend, attached to the receiver 28 by means of the pin 41 upon which the seat 46 swings.

The rear wall 72 of the trigger-bracket 70 is bent to provide two rearwardly-extending ears 73 and 74. The ear 73 just referred to has extending through it a screw 75 threaded into the under wall of the receiver 28 and serving to secure the rear end of the said trigger-bracket in place. The ear 74 just referred to of the trigger-bracket 70 mounts an internally-threaded bushing 76 receiving an adjusting-screw 77, the lower end of which engages the upper end of a trigger-spring 78, which latter has its lower end seated in a pocket 79 formed in the upper rear face of the finger-piece 57 of the trigger 54.

For the purpose of a better understanding of

the operation of the mechanism above described it is presumed that the parts are in the positions in which they are indicated in Fig. 3, the figure referred to, it will be noted that the breech-bolt is in its fully-closed-and-locked position and that the upper end of the seat-actuating plunger 60 is entered into the detent-notch 64 of the bolt-operating sleeve 48, thereby placing the seat-actuating spring 63 under tension which tends to depress the rear end of the seat 46. The depression of the rear end of the said seat prevented at this time, however, by the rest of the trigger-engaging shoulder 55 of the seat upon the seat-engaging shoulder 56 of the trigger 54.

It, now, the trigger 54 be operated by means of its finger-piece 57 to move its seat-engaging shoulder 55 forwardly from under the trigger-engaging shoulder 56 of the seat 46, the seat-actuating spring 63 will assert itself and swing the rear end of the said seat downwardly withdrawing the seat-dose 46 of the latter out of the path of the cocking-shoulder 43 of the firing-plunger 31. The said firing-plunger will thus be permitted to snap forwardly under the urge of its firing-spring 32 to impinge its firing-point against the rim of a cartridge located in the cartridge-chamber 22 of the barrel 21.

The movement of the seat 46 above described is effected by the seat-actuating spring 63 again the resistance of the seat-spring 61, owing to the location of the former spring at a greater distance from the transverse pin 41 than is the latter spring 61. It may be noted that when the seat-actuating spring 63 acts to downwardly swing the rear end of the seat 46, as above described, the latter will be very slight retraction of the firing-point until such time as the upper rear corner of the seat-dose 46 clears the lower forward corner of the cocking-shoulder 43 of the said firing-plunger. The parts will now have assumed the position in which they are indicated in Fig. 5.

The firearm having been fired, the next step in the use thereof would be to swing the bolt-handle 1 upwardly from the position in which it is shown in Fig. 4 into the position which it is shown in Fig. 7, thereby turning the bolt-operating sleeve 48 into position to bring its cam-surface 65 into registration with the upper end of the seat-actuating plunger 60, thus permitting the said plunger to move upwardly with reference to the seat 46 under the urge of the seat-actuating spring 63 until the stop-pin 66 of the said plunger engages the under face of the adjacent portion of the seat 46.

The engagement of the stop-pin 66 with the seat 46 as just above described serves to rock the rear end of the said seat from any further downward urge by the spring 63 and, owing to the clearance-dot 49 in the bolt 25, the trigger-engaging shoulder 55 of the bolt 25, the trigger-engaging shoulder of the said seat will be permitted to be released by the seat-spring 61 to point slightly above the seat-engaging shoulder 55 of the trigger 54, whereupon the said trigger will swing in a counterclockwise direction around in the drawings, to again interpose its shoulder 55 in the path of downward movement of the shoulder 55 of the seat 46.

The parts will now have assumed the position in which they are shown in Fig. 6, the bolt 25 may now be moved actually rearwardly by its now-upturned handle 41 to effect the extraction and ejection of the fired cartridge. After the bolt 25 has been moved to the limit

its normal rearward travel, it may then be moved forwardly by means of its handle 41 to engage the cocking-shoulder 43 of the firing-plunger 38 with the rear face 44 of the sear-nose 48. The further forward travel of the bolt will compress the firing-spring 32 and ultimately bring the cam-surface 45 of the bolt-operating sleeve 40 into position for engagement with the upper end of the sear-actuating plunger 50.

Now when the handle 41 of the bolt-operating sleeve 40 is swung downwardly into its normal position, in which its rear surface engages with a locking-abutment 55 in the side wall of the receiver 20, the cam-surface 55 of the said bolt-operating sleeve 40 will act to fully depress the sear-actuating plunger 50, thus tensioning the sear-actuating spring 53. The said spring 53 will, when so tensioned, swing the rear portion of the sear 46 slightly downwardly until such movement is checked by the engagement of the shoulder 56 of the said sear with the shoulder 54 of the trigger 34.

The parts will now have reassumed the positions in which they are shown in Fig. 3. In which figure, it will be observed, the sear-engaging shoulder 56 of the trigger 34 extends rearwardly beneath the trigger-engaging shoulder 55 of the sear 46 and thus prevents the sear-actuating spring 53 from depressing the rear portion of the said sear until such time as the trigger is again pulled.

By means of the foregoing construction, a firearm is provided in which the trigger-pull required to effect the release of the firing-plunger 38, or other firing-member, is markedly uniform, thus providing a firearm having, to an outstanding degree, one of the qualities most desired by marksmen.

The invention may be carried out in other specific ways than that herein set forth without departing from the spirit and essential characteristics of the invention, and the present embodiment is therefore to be considered in all respects as illustrative and not restrictive, and all changes coming within the meaning and equivalency range of the appended claims are intended to be embraced therein.

I claim:

1. A sear-mechanism for firearms, including in combination: a spring-pressed firing-member; a sear serving to releasably hold the said firing-member in its cocked position; a trigger having a portion coacting with the said sear to releasably hold the same in position to restrain the said firing-member; and spring-means urging the said sear into its firing-member-releasing position when the firearm is cocked, and also serving to move the said sear into position to release the said firing-member when the said trigger is operated.

2. A sear-mechanism for firearms, including in combination: a spring-pressed firing-member; a sear serving to releasably hold the said firing-member in its cocked position; a trigger having a portion coacting with the said sear to releasably hold the same in position to restrain the said firing-member; spring-means urging the said sear into a position to hold the said firing-member in its cocked position; and second spring-means urging the said sear into its firing-member-releasing position when the firearm is cocked, and also serving to move the said sear into position to release the said firing-member when the said trigger is operated.

3. A sear-mechanism for firearms, including in combination: a spring-pressed firing-member; a

sear serving to releasably hold the said firing-member in its cocked position; a trigger having a portion coacting with the said sear to releasably hold the same in position to restrain the said firing-member; and spring-means carried by the said sear and urging the said sear into its firing-member-releasing position when the firearm is cocked, and also serving to move the same into position to release the said firing-member when the said trigger is operated.

4. A sear-mechanism for firearms, including in combination: a spring-pressed firing-member; a sear serving to releasably hold the said firing-member in its cocked position; a trigger having a portion coacting with the said sear to releasably hold the same in position to restrain the said firing-member; spring-means urging the said sear into a position to hold the said firing-member in its cocked position; and second spring-means carried by the said sear and urging the said sear into its firing-member-releasing position when the firearm is cocked, and also serving to move the same into position to release the said firing-member when the said trigger is operated.

5. A sear-mechanism for firearms, including in combination: a spring-pressed firing-member; a sear serving to releasably hold the said firing-member in its cocked position; a trigger having a portion coacting with the said sear to releasably hold the same in position to restrain the said firing-member; and a spring-pressed plunger urging the said sear into its firing-member-releasing position when the firearm is cocked, and also serving to move the said sear into position to release the said firing-member when the said trigger is operated.

6. A sear-mechanism for firearms, including in combination: a spring-pressed firing-member; a sear serving to releasably hold the said firing-member in its cocked position; a trigger having a portion coacting with the said sear to releasably hold the same in position to restrain the said firing-member; spring-means urging the said sear into a position to hold the said firing-member in its cocked position; and a spring-pressed plunger carried by the said sear and urging the said sear into its firing-member-releasing position when the firearm is cocked, and also serving to move the same into position to release the said firing-member when the said trigger is operated.

7. In a bolt-action firearm, the combination with the bolt-unit thereof, of a spring-pressed firing-member; a sear serving to releasably hold the said firing-member in its cocked position; a trigger controlling the said sear; spring-means urging the said sear into position to hold the said firing-member in its cocked position; and second spring-means constructed and arranged to be tensioned and relaxed by the movement of the said bolt-unit and serving when tensioned to move the said sear into position to release the said firing-member when the said trigger is operated.

8. In a bolt-action firearm, the combination with the bolt-unit thereof, of a spring-pressed firing-member; a sear serving to releasably hold the said firing-member in its cocked position; a trigger controlling the said sear; spring-means urging the said sear into position to hold the said firing-member in its cocked position; and second spring-means constructed and arranged to be tensioned by the closing movement of the said bolt-unit and relaxed by the opening movement thereof and serving when so tensioned to move the said

sear into position to release the said firing-member when the said trigger is operated.

9. In a bolt-action firearm, the combination with the bolt-unit thereof, of a spring-pressed firing-member; a sear serving to releasably hold the said firing-member in its cocked position; a trigger controlling the said sear; spring-means urging the said sear in a position to hold the said firing-member in its cocked position; and second spring-means carried by the said sear and constructed and arranged to be tensioned to move the said sear into position to release the said firing-member when the said trigger is operated.

10. In a bolt-action firearm, the combination with the bolt-unit thereof, of a spring-pressed firing-member; a sear serving to releasably hold the said firing-member in its cocked position; a trigger controlling the said sear; spring-means urging the said sear in a position to hold the said firing-member in its cocked position; and second spring-means carried by the said sear and constructed and arranged to be tensioned by the closing movement of the said bolt-unit and relaxed by the opening movement thereof and serving when so tensioned to move the said sear into position to release the said firing-member when the said trigger is operated.

11. In a bolt-action firearm, the combination with the bolt-unit thereof, of a spring-pressed firing-member; a sear serving to releasably hold the said firing-member in its cocked position; a trigger controlling the said sear; spring-means urging the said sear in a position to hold the said firing-member in its cocked position; and a spring-pressed plunger carried by the said sear and constructed and arranged to be tensioned and relaxed by the movement of the bolt-unit and serving when tensioned to move the said sear into position to release the said firing-member when the said trigger is operated.

12. In an upturn-and-pullback firearm, the combination with a bolt-unit including a bolt-handle swinging transversely of the firearm; of a spring-pressed firing-member; a sear serving to releasably hold the said firing-member in its cocked position; a trigger coacting with the said sear; spring-means urging the said sear into position to hold the said firing-member in its cocked position; and second spring-means constructed and arranged to be tensioned and relaxed by the swinging movement of the said bolt-handle and serving when tensioned to move the said sear into position to release the said firing-member when the said trigger is operated.

13. In an upturn-and-pullback firearm, the combination with a bolt-unit including a bolt-handle swinging transversely of the firearm; of a spring-pressed firing-member; a sear serving to

releasably hold the said firing-member in its cocked position; a trigger coacting with the said sear; spring-means urging the said sear into position to hold the said firing-member in its cocked position; and second spring-means constructed and arranged to be tensioned by the bolt-locking movement of the said bolt-handle and relaxed by the unlocking movement thereof and serving when so tensioned to move the said sear into position to release the said firing-member when the said trigger is operated.

14. In an upturn-and-pullback firearm, the combination with a bolt-unit including a bolt-handle swinging transversely of the firearm; of a spring-pressed firing-member; a sear serving to releasably hold the said firing-member in its cocked position; a trigger coacting with the said sear; spring-means urging the said sear in a position to hold the said firing-member in its cocked position; and second spring-means carried by the said sear and constructed and arranged to be tensioned and relaxed by the swinging movement of the said bolt-handle and serving when tensioned to move the said sear into position to release the said firing-member when the said trigger is operated.

15. In an upturn-and-pullback firearm, the combination with a bolt-unit including a bolt-handle swinging transversely of the firearm; of a spring-pressed firing-member; a sear serving to releasably hold the said firing-member in its cocked position; a trigger coacting with the said sear; spring-means urging the said sear in a position to hold the said firing-member in its cocked position; and second spring-means carried by the said sear and constructed and arranged to be tensioned by the bolt-locking movement of the said bolt-handle and relaxed by the unlocking movement thereof and serving when so tensioned to move the said sear into position to release the said firing-member when the said trigger is operated.

16. In an upturn-and-pullback firearm, the combination with a bolt-unit including a bolt-handle swinging transversely of the arm; of a spring-pressed firing-member; a sear serving to releasably hold the said firing-member in its cocked position; a trigger coacting with the said sear; spring-means urging the said sear in a position to hold the said firing-member in its cocked position; and a spring-pressed plunger carried by the said sear and constructed and arranged to be tensioned and relaxed by the swinging movement of the said bolt-handle and serving when tensioned to move the said sear into position to release the said firing-member when the said trigger is operated.

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DISCLAIMER

2,069,887.—*Albert F. Laudensack, New Haven, Conn.* SEAR-MECHANISM FOR FIRE-ARMS. Patent dated February 9, 1937. Disclaimer filed September 2, 1938, by the patentee; the assignee, *Winchester Repeating Arms Company*, concurring.

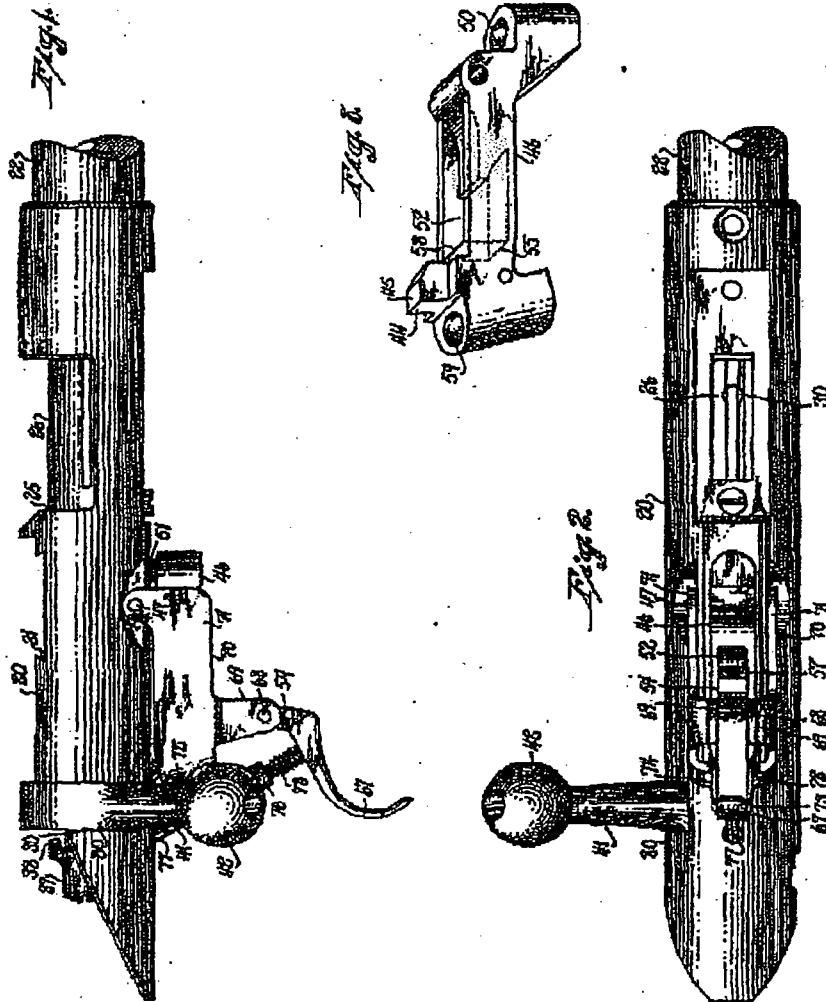
Hereby disclaims claims 1, 2, 5, and 7.
[Official Gazette September 27, 1938.]

Feb. 9, 1937.

A. F. LAUDENSACK
SEAR MECHANISM FOR FIREARMS
Filed July 31, 1935

2,069,887

4 Sheets-Sheet 1



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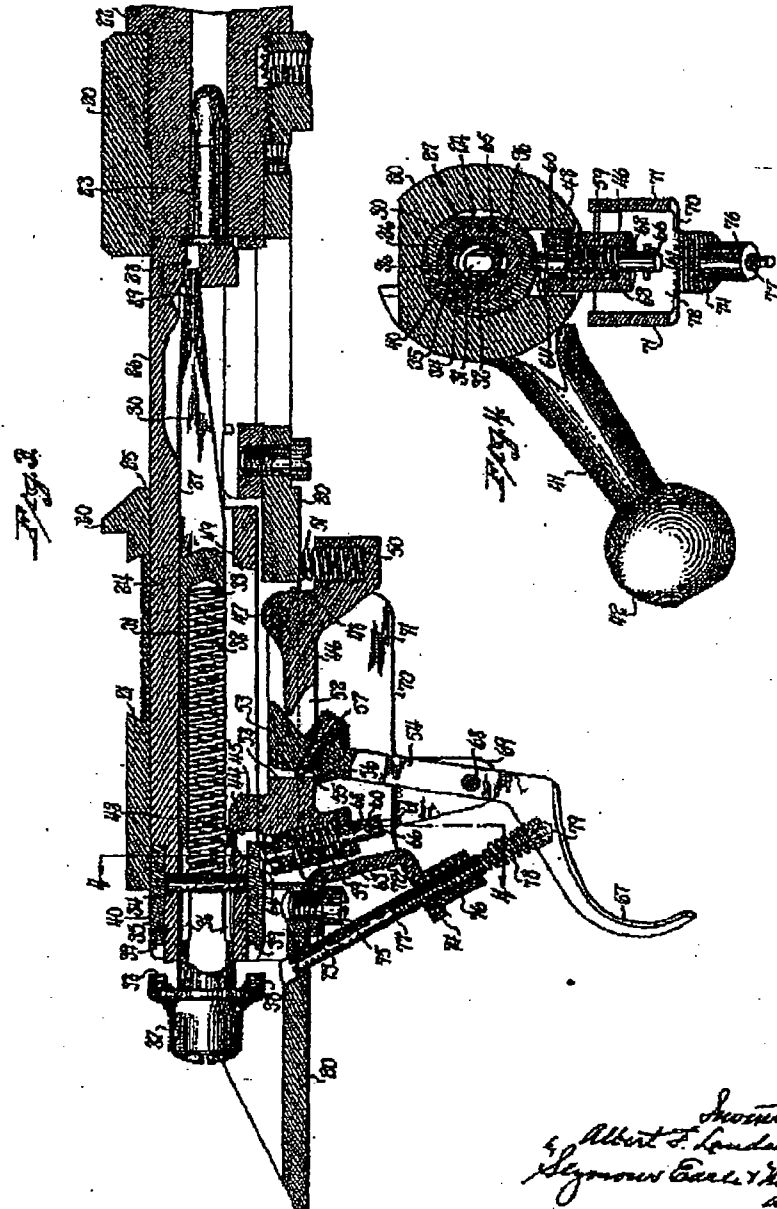
A. F. LAUDENSACK

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SEAR MECHANISM FOR FIREARMS

Filed July 31, 1935

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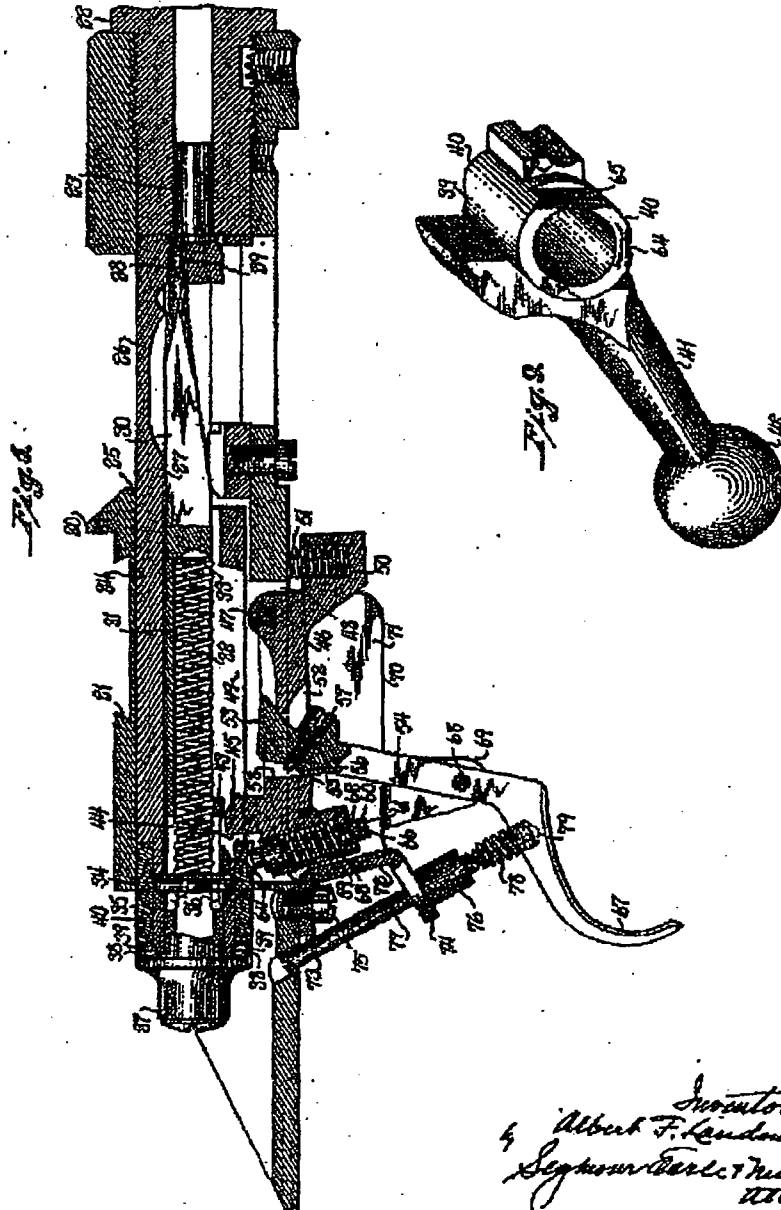


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SEAR MECHANISM FOR FIREARMS
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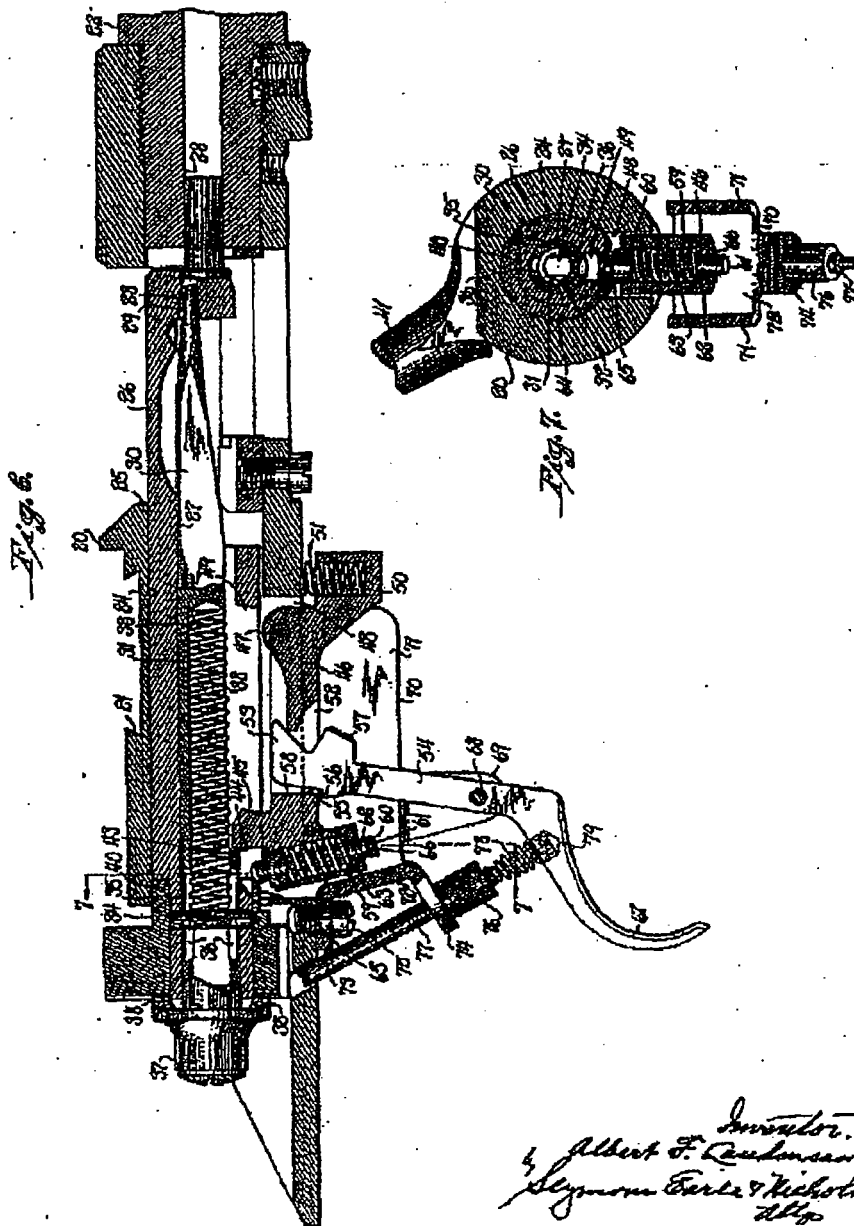
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4 Sheets-Sheet 4



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