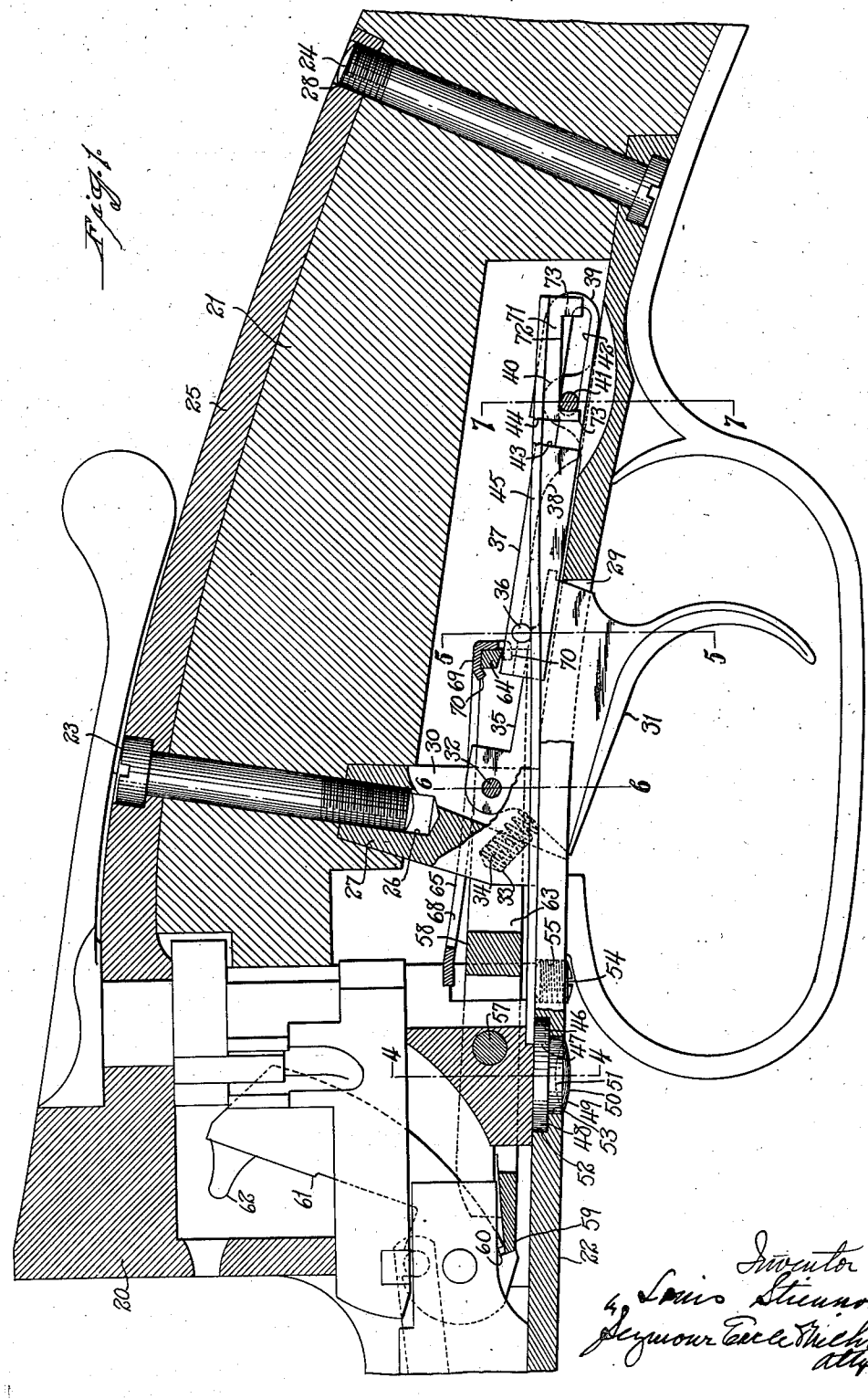
April 23, 1935. L. STIENNON 1,998,596

ADJUSTABLE PULL TRIGGER MECHANISM FOR FIREARMS

Filed Oct. 7, 1932 5 Sheets-Sheet 1

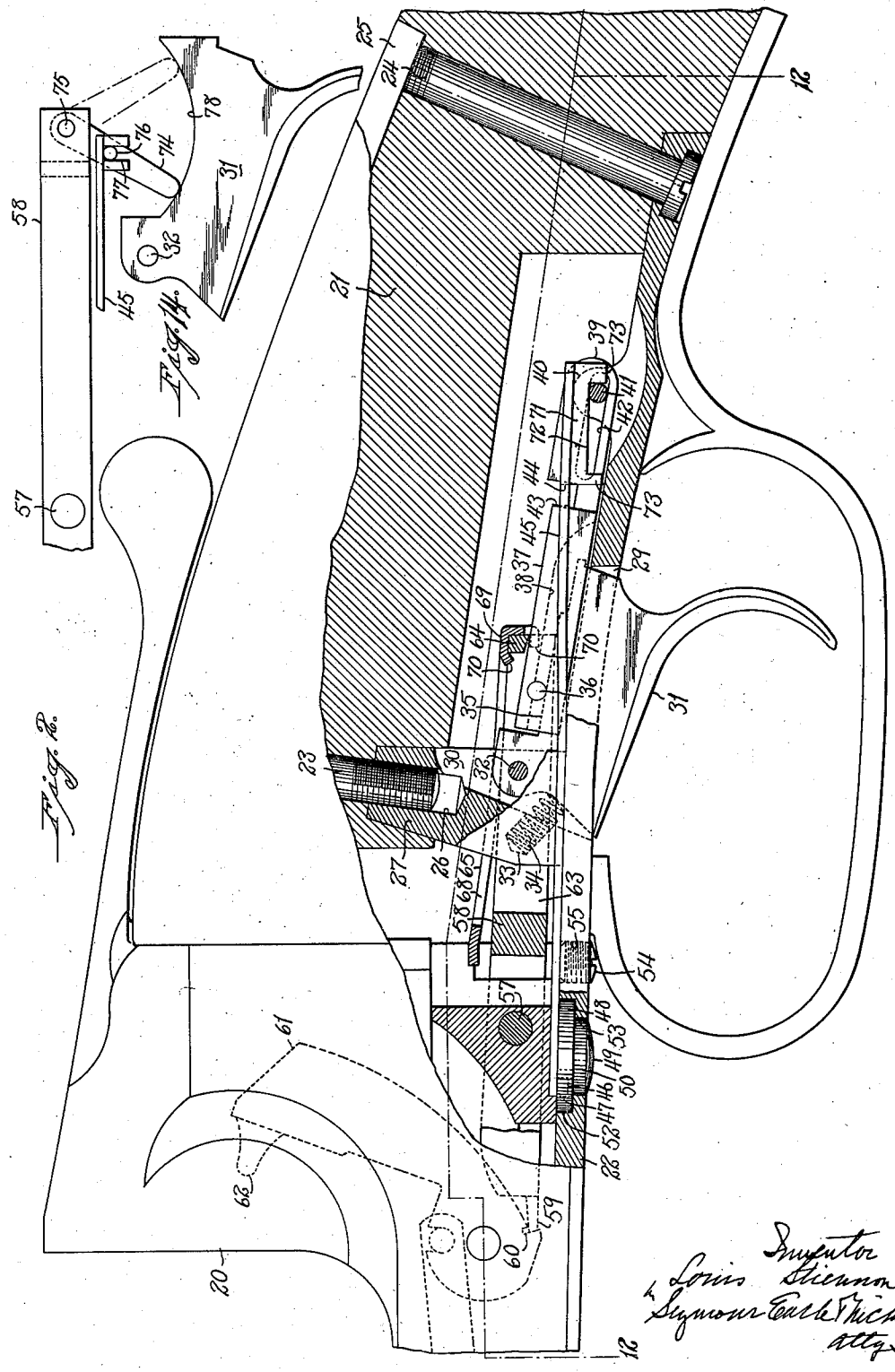


Inventor
Louis Stiennon
by Seymour Earle Nichols
Atty

April 23, 1935. L. STIENNON 1,998,596

ADJUSTABLE PULL TRIGGER MECHANISM FOR FIREARMS

Filed Oct. 7, 1932 5 Sheets-Sheet 2



April 23, 1935. L. STIENNON 1,998,596

ADJUSTABLE PULL TRIGGER MECHANISM FOR FIREARMS

Filed Oct. 7, 1932 5 Sheets-Sheet 3

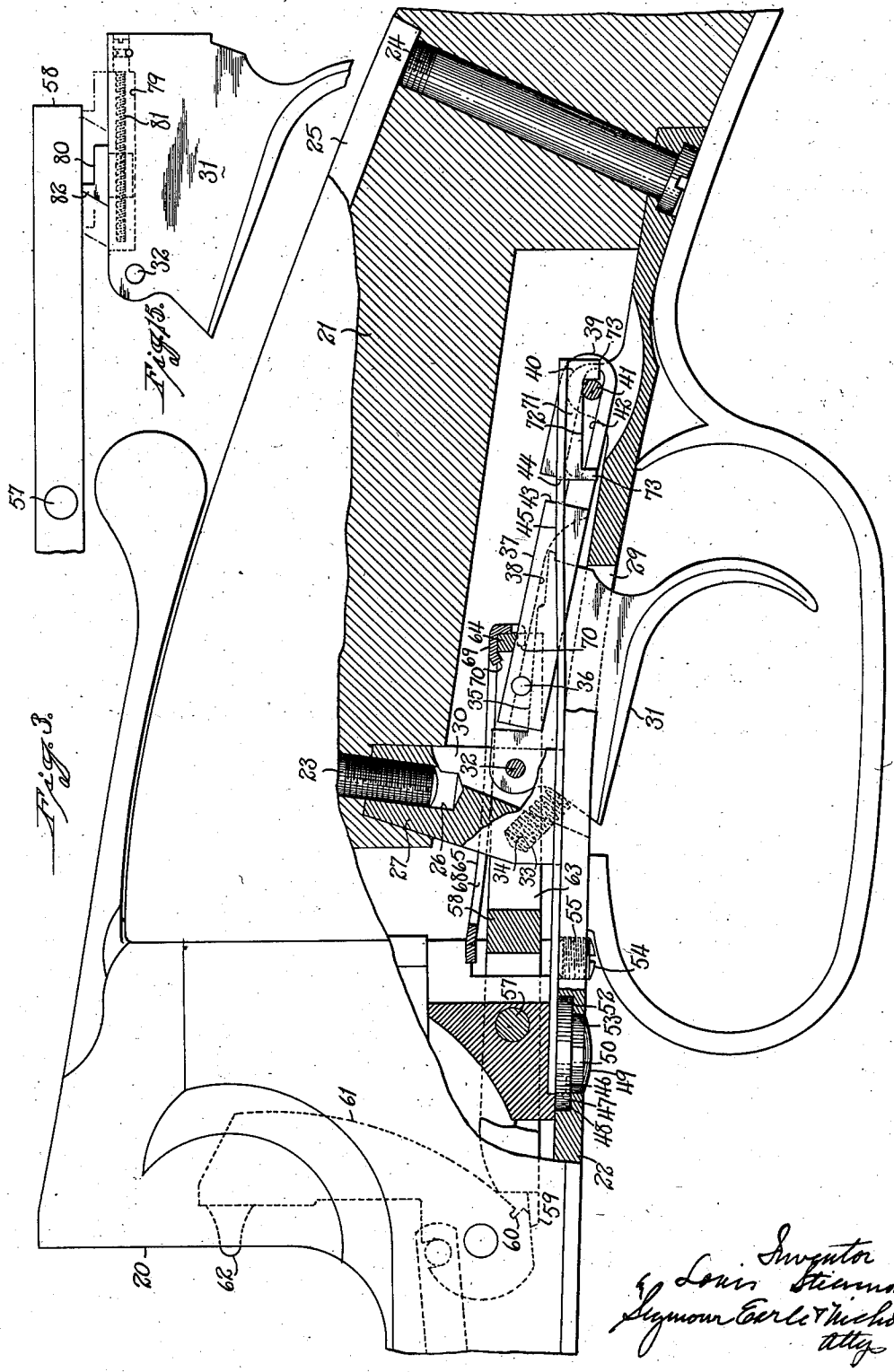


Fig. 3.

Inventor
Louis Stiennon
by Seymour Earle & Nichols
Attys

April 23, 1935. L. STIENNON 1,998,596

ADJUSTABLE PULL TRIGGER MECHANISM FOR FIREARMS

Filed Oct. 7, 1932 5 Sheets-Sheet 4

Fig. 4.

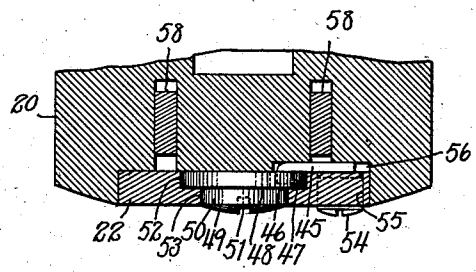


Fig. 5.

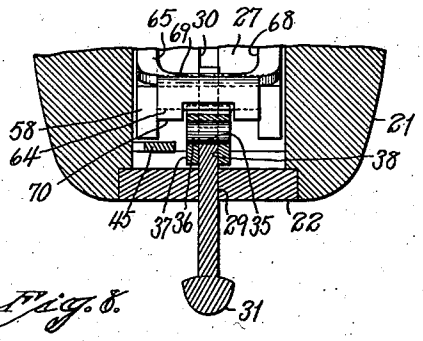


Fig. 8.

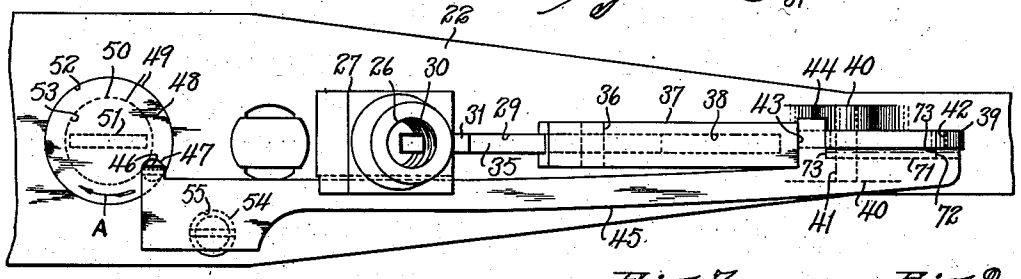


Fig. 6.

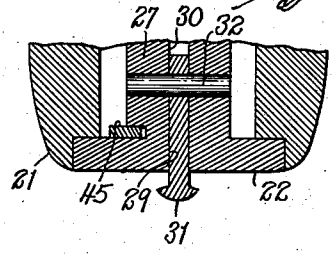


Fig. 7.

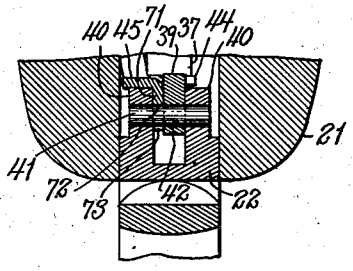


Fig. 9.

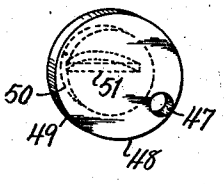


Fig. 10.

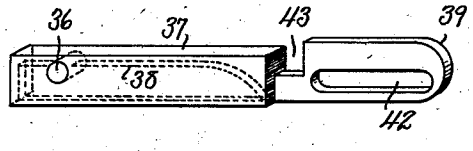
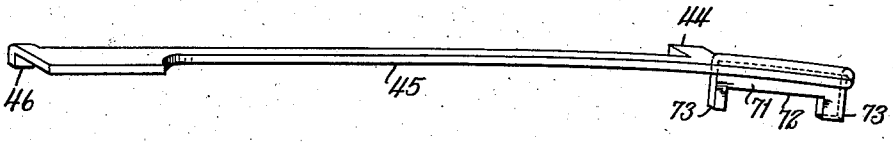


Fig. 11.



Inventor
Louis Stiennon
by Seymour Earle Nichols
Attys

April 23, 1935. L. STIENNON 1,998,596

ADJUSTABLE PULL TRIGGER MECHANISM FOR FIREARMS

Filed Oct. 7, 1932 5 Sheets-Sheet 5

Fig. 1a.

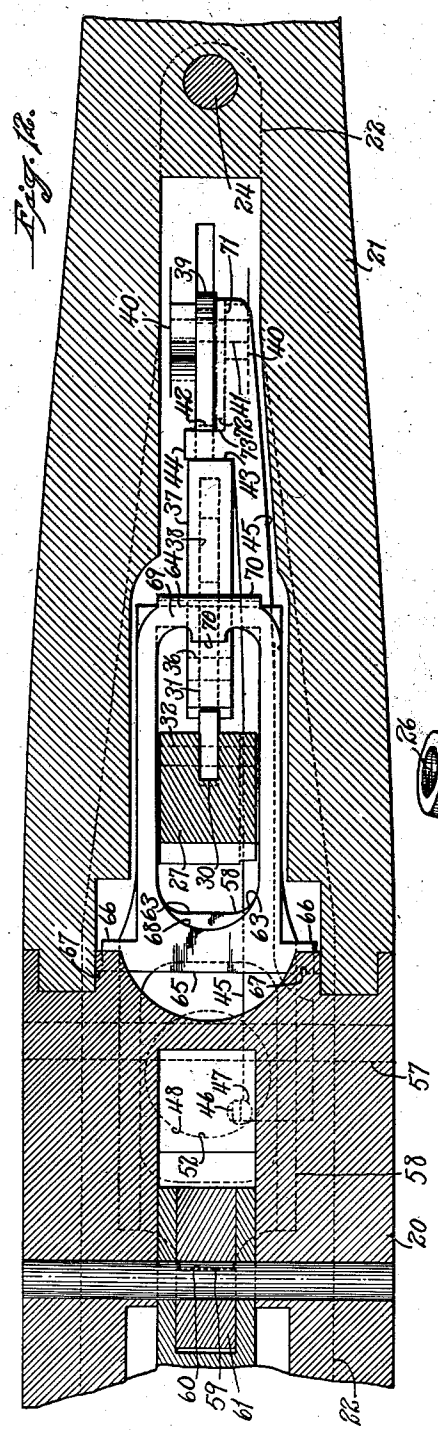
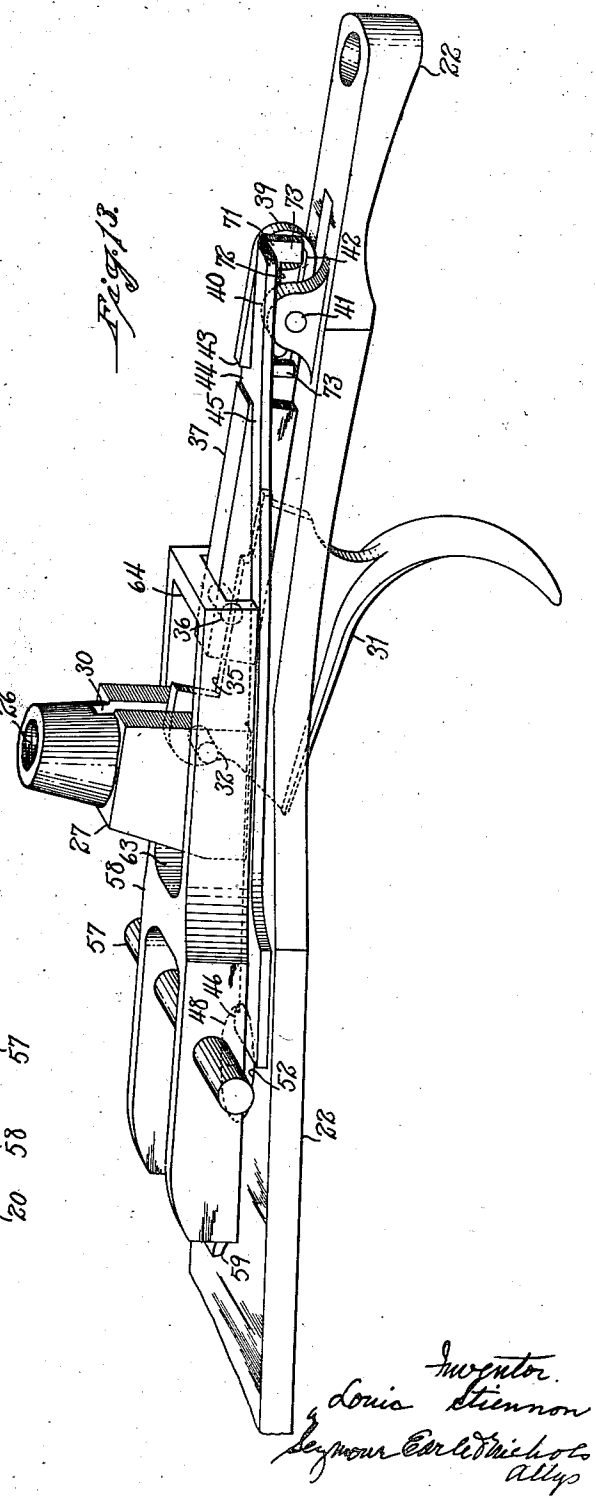


Fig. 1b.



Inventor
Louis Stiennon
Seymour Earle Nichols
Atty

Patented Apr. 23, 1935 1,998,596

UNITED STATES PATENT OFFICE

1,998,596

ADJUSTABLE-PULL TRIGGER-MECHANISM FOR FIREARMS

Louis Stiennon, New Haven, Conn., assignor to Winchester Repeating Arms Company, New Haven, Conn., a corporation of Maryland

Application October 7, 1932, Serial No. 636,634

9 Claims. (Cl. 42—69)

This invention relates to an improvement in trigger-mechanisms for firearms and relates in particular to that class of trigger-mechanisms in which a sear is actuated by a separately-formed trigger.

Since the inception of the mass production of standardized firearms, the adjusting or regulating within satisfactory limits of pressure of the so-called "trigger-pull," i. e., the force required to release the sear for firing the arm, has been a difficult and, in a practical sense, an unsolved problem. Efforts have been heretofore made to provide for such regulation or adjustment by more or less makeshift expedients such, for instance, as by filing or oilstoning the sear-nose, or by bending or changing the thickness of the springs involved so as to effect an increase or decrease in tension.

None of the prior modes of adjusting or regulating the trigger-pull have afforded either the manufacturer or the user of the arm any really practicable means of regulating or adjusting the trigger-pull to suit individual tastes or requirements, or to compensate for changes due to wear, etc.

One of the main objects of my present invention is to provide a trigger-mechanism embodying simple, reliable and effective means for regulating or adjusting the "trigger-pull," i. e., the force required to be exerted upon the trigger in order to release the separately-formed sear for firing the arm.

Another object of my present invention is to provide at a low cost for manufacture a trigger-mechanism of the type referred to, in which the adjusting-means is readily accessible and may be conveniently operated.

With the above and other objects in view, my invention contemplates an adjustable trigger-mechanism for firearms, in which there is interposed between the trigger and sear a third member which may be characterized as a shiftable "transmitting-member" inasmuch as it serves in a broad sense to transmit the movement of the trigger to the sear, and is shiftable in whole or in part with respect to at least one thereof for varying the trigger-pull, as will more fully appear from the following.

My invention further consists in an adjustable trigger-mechanism for firearms having certain features of construction and combinations and arrangements of parts as will more fully appear from the following and be set forth in the appended claims.

The trigger-mechanisms herein chosen for the purpose of illustrating my invention include a manually-adjustable transmitting-member interposed between and movable with respect to the respective pivot points of the trigger and the sear of the firearm, in such manner that the effective arm length of one or more of the levers involved may be adjusted for the purpose mentioned.

In the accompanying drawings:

Fig. 1 is a broken view partly in side elevation and partly in vertical central-longitudinal section of the frame-portion of a shot gun, in which is incorporated a trigger-mechanism constructed in accordance with my invention, the gun being cocked and the transmitting-member being shown as adjusted to the limit of its movement in the direction required for increasing the force required to be exerted upon the trigger;

Fig. 2 is a view corresponding to Fig. 1, but showing the transmitting-member as adjusted to the limit of its movement in the direction required for easing or lessening the force required to be exerted upon the trigger;

Fig. 3 is a view corresponding to Fig. 2, but showing the parts in the positions which they assume when the trigger is pulled and the sear disengaged from the hammer, which latter is shown as swung into its firing position;

Fig. 4 is a broken transverse sectional view, taken on the line 4—4 of Fig. 1;

Fig. 5 is a similar view, taken on the line 5—5 of Fig. 1;

Fig. 6 is a similar view, taken on the line 6—6 of Fig. 1;

Fig. 7 is a similar view, taken on the line 7—7 of Fig. 1;

Fig. 8 is a broken top or plan view of the trigger-plate, detached, and showing the parts of my improved trigger-mechanism which are normally organized therewith;

Fig. 9 is a perspective view of the rotary adjusting-member, detached;

Fig. 10 is a perspective view of the transmitting-member, detached;

Fig. 11 is a similar view of the adjusting-link, detached;

Fig. 12 is a broken view in transverse longitudinal section, taken on the line 12—12 of Fig. 2;

Fig. 13 is a perspective view of the trigger-plate, detached, together with the parts of my improved mechanism normally organized therewith, the sear being also shown in appropriate relationship to the other elements;

Fig. 14 is a broken schematic view illustrating

another form which my invention may assume; and

Fig. 15 is a similar view illustrating still another form which my invention may assume.

The particular firearm herein chosen in Figs. 1 to 13 inclusive for the illustration of my invention includes a frame 20, a butt-stock 21 and a trigger-plate 22, all of usual characteristics.

For the purpose of securing together the frame 20, butt-stock 21 and trigger-plate 22, I employ two or more fastening-screws 23 and 24, the former of which projects downwardly through the rearwardly-extending tang 25 of the frame 20, through the butt-stock 21 and into a threaded bore 26 formed in a lug 27 upstanding from the trigger-plate 22. The screw 24 before referred to passes upwardly through the rear end of the said trigger-plate 22, through a suitable perforation in the butt-stock 21, and into a threaded bore 28 formed in the tang 25 adjacent the rear end thereof, in the usual manner of firearms.

The trigger-plate 22 before referred to is formed adjacent its lug 27 with a vertical longitudinal slot 29 which intersects a vertical slot 30 formed in the rear face of the said lug 27 and virtually constitutes an extension of the said slot 29. Installed in the slots 29 and 30 is a pivotal trigger 31 of usual form, and hung upon a transverse pin 32 mounted in the lug 27. The slot 30 in the lug 27 has intersecting it an upwardly and forwardly inclined socket 33 receiving the rear end of a helical trigger-spring 34 which bears against the trigger, as shown, and exerts a mild effort to swing the said trigger in a counter-clockwise direction to normally maintain the upper edge or lifting-face 35 of the same in contact with a transverse transmitting-pin 36 mounted in and forming a feature of a transmitting-member 37.

The transmitting-member 37, just above referred to, is mounted with capacity for both longitudinal sliding movement and vertical rocking movement, as will more fully appear, and has the under face of its forward portion formed with a longitudinal groove 38 freely receiving the rear portion of the trigger 31 and traversed laterally by the transmitting-pin 36 before referred to. The rear portion of the transmitting-member 37 is shaped to form a tongue 39 positioned between a pair of complementary ears 40—40 upstanding from the upper face of the trigger-plate 22 adjacent the rear end thereof and formed integral therewith. Extending transversely between the ears 40—40 just referred to is a pin 41 which also passes through a longitudinal slot 42 formed in the said tongue 39 and designed to permit the transmitting-member to both rock and move bodily longitudinally with respect to the gun structure.

At its forward end where it joins the body-proper of the member 37, the tongue 39 is formed in its upper edge with a coupling-notch 43 receiving a coupling-finger 44 laterally-offsetting from the side edge of a sheet-metal adjusting-link 45 extending forwardly along one side of the transmitting-member 37 and lug 27. Adjacent its extreme forward end, the said link 45 is provided with a downwardly-offsetting coupling-finger 46 entering into an eccentrically-positioned socket 47 formed in the upper surface of the flange-portion 48 of a rotary adjusting-member 49, which latter also includes a short cylindrical body-portion 50 provided in its under face with a kerf 51 for the reception of a screw driver or other tool for the purpose as will hereinafter appear. The flange-portion 48 of the said adjusting-member 49 is seated in a recess 52 formed in the upper face of the trigger-plate 22 and intersecting a coaxial passage 53 through which the body-portion 50 of the said adjusting-member extends downwardly to expose its slotted under face through the under face of the said trigger-plate 22.

For the purpose of locking the adjusting-link 45 in any given position of its movement to thus in turn lock the transmitting-member 37 against accidental longitudinal movement, I provide a locking-screw 54 threaded through a vertical threaded bore 55 in the trigger-plate 22 adjacent one edge thereof and having its upper end engageable with the under face of the adjacent portion of the link 45 to clamp the same against the under face of a longitudinal passage 56 formed in the frame 20 immediately above the trigger-plate 22, as clearly shown in Fig. 4.

Pivotally mounted upon a transverse pin 57 is a skeletonized sear 58 having the usual characteristics and including a sear-nose 59 adapted to engage a sear-notch 60 formed in a swinging-hammer 61 or other equivalent firing-member. The particular firing-member herein chosen for illustration, namely, the swinging-hammer 61, is provided with the usual hammer-spring (not shown) and carries the usual firing-pin 62 adapted to engage the primer of a cartridge for firing the same in the usual manner of firearms. The rear portion of the sear 58 is formed with a vertical clearance-passage 63 through which the lug 27 of the trigger-plate 22, as well as the upper forward portion of the trigger 31, extends. The rear wall of the passage 63 just referred to in the sear 58 is formed by a cross-bar 64 normally overlying the upper surface of the transmitting-member 37 for being engaged thereby.

For engaging the sear-nose 59 of the sear 58 with the sear-notch 60 I employ a sheet-metal spring 65 having oppositely-projecting lateral tongues 66—66 (Fig. 12), each of which is positioned in a rearwardly-opening notch 67 formed in the frame 20. The said sear-spring 65 is formed with a central clearance-opening 68 substantially corresponding to the clearance-passage 63 in the sear 58 and providing a clearance for both the lug 27 and the upper forward portion of the trigger 31. Likewise, the sear-spring 65 is formed at its rear end with a cross-bar 69 resting upon the upper surface of the cross-bar 64 of the said sear and exerting a constant effort to depress the same. Fingers 70 offsetting from the sear-spring 65 serve to interlock the rear end thereof with the cross-bar 64 of the said sear.

For the purpose of limiting the longitudinal movement of the adjusting-link 45 I employ adjacent the rear end of the latter a downwardly-extending arm 71 formed in its under edge with a downwardly-opening notch 72 receiving the pivot-pin 41 and flanked at each of its respective opposite ends by a stop-finger 73.

With the firearm cocked as shown in Figs. 1 and 2 a rearward force exerted upon the finger-piece of the trigger 31 will turn the latter upon its pin 32 with the effect of causing the lifting-surface 35 of the said trigger to lift the forward end of the transmitting-member 37 which will pivot upon the transverse pin 41. The upward swinging movement of the transmitting-member 37 will by reason of its location beneath the cross-bar 64 of the sear 58 rock the latter in a counter-clockwise direction against the tension of the

sear-spring 65 and disengage the sear-nose 59 from the sear-notch 60 in the hammer 61 and thus permit the upper end of the latter, together with the firing-pin 62, to be snapped forward in the usual manner for firing the arm. The sear 58 and hammer 61 will now have assumed the positions in which they are shown in Fig. 3.

Regardless of whether the trigger-mechanism is adjusted to provide either a heavy or light trigger-pull, the operation above referred to will be, in all essentials, the same.

In Fig. 1 the transmitting-member 37 is shown in its rearmost position in which the heaviest trigger-pull within the range of the mechanism, is required to release the hammer for firing the arm. It will be noted in the figure referred to that the contact-point of the transmitting-member 37, i. e., the transmitting-pin 36, is now located at its furthermost position away from the pin 32 upon which the trigger 31 swings, so that the force required to be exerted upon the trigger for rocking the transmitting-member against a given load will be at its maximum and hence the mechanism may be said to be adjusted to require the heaviest trigger-pull within its range. Also as shown it will be noted that the transmitting-pin 36 in the position referred to is located rearwardly of the cross-bar 64 of the sear 58.

By turning the rotary adjusting-member 49 in a direction indicated by the arrow A in Fig. 8 a forward sliding movement will be imparted to the adjusting-link 45 with the effect, due to the interlocking of the finger 44 and the notch 43, of moving the transmitting-member 37 together with its transmitting-pin 36 in the same direction. This movement will shift the contact-point, i. e., the pin 36, forwardly toward the pin 32 upon which the trigger 31 swings and therefore decrease the amount of force which must be applied to the trigger in order to fire the arm.

The movement for lessening or lightening the so-called "trigger-pull" as just above described may be continued if desired until the rearmost of the stop-fingers 73 upon the adjusting-link 45 engages with the rear face of the pin 41 at which time the mechanism will have been adjusted to provide the lightest trigger-pull within its range. The transmitting-member 37 and its link 45, etc., will now have assumed the positions in which they are shown in Fig. 2, in which it will be noted that the transmitting-pin 36 is located in its furthest advanced position in the direction of the trigger-pin 32 and therefore forward of the cross-bar 64 of the sear 58.

When adjusted to afford the user the desired trigger-pull the link 45 and hence the transmitting-member 37 may be locked in such position of adjustment by inwardly screwing the locking-screw 54 as before described.

If desired in order to regulate or adjust the trigger-pull, I may resort to a construction such, for instance, as that schematically shown in Fig. 14, in which the transmitting-member is in the form of a swinging-arm 74 pivotally mounted by means of a pin 75 to the rear end of the sear 58 and provided with a laterally-offsetting pin 76 entered into a notch 77 provided in the rear end of the adjusting-link 45. The lower or free end of the arm-like transmitting-member 74 is adapted to engage an upwardly-facing arcuate-shaped lifting-surface 78 provided upon the upper edge of the trigger 31. It will be obvious by reference to Fig. 14 that when the arm 74 is swung to the limit of its forward movement, its lower end will be relatively close to the trigger-pin 31 so that the force required to be exerted upon the trigger for swinging the sear and firing the arm will be at the minimum. Conversely, when the arm 74 is moved to the limit of its rearward swing, as indicated by broken lines in Fig. 14 the free end of the said arm will be furthermost from the trigger-pin 32 and hence require the exertion of a greater force upon the trigger 31 in order to rock the sear and fire the arm.

In Fig. 15 I have schematically shown still another mode of carrying out my invention, which consists in providing the upper edge of the trigger 31 with a longitudinal groove 79 in which is mounted a transmitting-member in the form of a slide 80 adjustable longitudinally of the said trigger by any approved means such, for instance, as the rotary adjusting-screw 81 shown. The slide-like transmitting-member 80 just referred to is provided with an upwardly-offsetting contact-nose 82 adapted to engage the under side of the sear 58 at different positions thereon within the limits of the longitudinal movement of the said slide. It will be obvious that when the slide-like transmitting-member 80 is at the limit of its forward adjustment it will diminish the force required to be exerted upon the trigger in order to operate the sear, and conversely when the said transmitting-member is at the limit of its rearward movement the force required to be exerted upon the trigger will be increased to the maximum within the range of the device.

The various forms of trigger-mechanisms herein illustrated and described are in no sense exhaustive of the various forms which my invention may assume, but are merely illustrative of some of the variants thereof.

In each of the embodiments of my invention herein chosen for illustration it will be noted that a transmitting-member is employed which is adjustable with reference to both the trigger and the sear in such manner as to adjust the force required to be exerted upon the trigger for firing the arm, though it will be understood by those skilled in the art that I do not limit my invention to the embodiments herein shown but only as indicated in the appended claims.

I claim:

1. In an adjustable-pull trigger-mechanism for firearms, the combination with the pivotal trigger and separately-formed pivotal sear thereof; of an adjustable pull-regulating transmitting-member mounted in the firearm structure independently of both the said trigger and the said sear, for both rocking and reciprocating movement and operatively interposed between the said trigger and the said sear and constructed and arranged to transmit the movement of the former to the latter when in any given one of a plurality of positions of adjustment and movable toward and away from the pivots of both thereof to adjust the force required to be exerted upon the said trigger for actuating the said sear.

2. In an adjustable-pull trigger-mechanism for firearms, the combination with the trigger and separately-formed sear thereof; of an adjustable pull-regulating transmitting-member located within the firearm structure and operatively interposed between the said trigger and the said sear and constructed and arranged to transmit the movement of the former to the latter when in any given one of a plurality of positions of adjustment; an adjusting-member exposed upon the exterior surface of the firearm for manual operation; and means including a link for opera-

tively connecting the said adjusting-member to the said transmitting-member for moving the same to adjust the force required to be exerted upon the said trigger for actuating the said sear.

3. In an adjustable-pull trigger-mechanism for firearms, the combination with the trigger and separately-formed sear thereof; of an adjustable pull-regulating transmitting-member located within the firearm structure and operatively interposed between the said trigger and the said sear and constructed and arranged to transmit the movement of the former to the latter when in any given one of a plurality of positions of adjustment; a rotary adjusting-member exposed upon the exterior surface of the firearm for manual operation; and a link operatively connecting the said rotary adjusting-member to the said transmitting-member for moving the same to adjust the force required to be exerted upon the said trigger for actuating the said sear.

4. In an adjustable-pull trigger-mechanism for firearms, the combination with the trigger and separately-formed sear thereof; of an adjustable pull-regulating transmitting-member mounted for reciprocating movement within the firearm structure and operatively interposed between the said trigger and the said sear and constructed and arranged to transmit the movement of the former to the latter when in any given one of a plurality of positions of adjustment; a rotary adjusting-member positioned for manipulation from the exterior of the firearm structure; and a link operatively connecting the said rotary adjusting-member to the said transmitting-member for reciprocating the latter to adjust the force required to be exerted upon the said trigger for actuating the said sear.

5. In an adjustable pull trigger-mechanism for firearms, the combination with the trigger and separately-formed sear thereof; of an adjustable pull-regulating transmitting-member mounted for reciprocating movement and operatively interposed between the said trigger and the said sear and constructed and arranged to transmit the movement of the former to the latter when in any given one of a plurality of positions of adjustment; a rotary adjusting-member; and a link operatively interposed between the said rotary adjusting-member and the said transmitting-member for converting a rotary movement of the former into a reciprocating movement of the latter to adjust the force required to be exerted upon the said trigger for actuating the said sear.

6. In an adjustable pull trigger-mechanism for firearms, the combination with the trigger and separately-formed sear thereof; of a rocking and reciprocating pull-regulating transmitting-lever having a slot formed therein and operatively interposed between the said trigger and the said sear for transmitting the movement of the former to the latter when in any given one of a plurality of positions of adjustment; and a pivot extending through the slot in the said transmitting-lever to form a guide for both the rocking and reciprocating movement of the latter.

7. In an adjustable pull trigger-mechanism for firearms, the combination with the trigger and separately-formed sear thereof; of an adjustable pivotally-mounted pull-regulating transmitting-member operatively interposed between the said trigger and the said sear and designed to transmit the movement of the former to the latter when in any given one of a plurality of positions of adjustment and to one of which it is pivotally connected and with the other of which it has adjustable sliding engagement to adjust the force required to be exerted upon the said trigger for actuating the said sear.

8. In an adjustable pull trigger-mechanism for firearms, the combination with the trigger and separately-formed sear thereof; of an adjustable pivotally-mounted pull-regulating transmitting-member operatively interposed between the said trigger and the said sear and designed to transmit the movement of the former to the latter when in any given one of a plurality of positions of adjustment and pivotally connected to the said sear and having sliding engagement with the said trigger to adjust the force required to be exerted upon the said trigger for actuating the said sear.

9. In an adjustable-pull trigger-mechanism for firearms, the combination with a trigger and a sear; of an adjustable pull-regulating transmitting-member mounted within the firearm structure and operatively interposed between the said trigger and the said sear in position to transmit the movement of the former to the latter; a manual operating-member mounted in position for manual manipulation from the exterior of the firearm without requiring the demounting of the same; and means connecting the said operating-member to the said transmitting-member to transmit the movement of the former to the latter and thus regulate the same from the exterior of the firearm.

LOUIS STIENNON.