The invention described herein may be manufactured and used by or for the Government for governmental purposes, without the payment to me of any royalty thereon.

This invention relates to a trigger for machine guns.

The Browning machine gun, model of 1917, is provided with a trigger in the form of a simple lever which provides for automatic firing so long as it is held in the raised or firing position. Firing is interrupted only by releasing the trigger, but due to rapid action of the gun it is impossible to control single-shot firing.

The purpose of this invention is to provide a trigger which is capable of automatic and semi-automatic firing, which is simple and inexpensive, which may be readily installed to replace the present Browning trigger without altering the gun or modifying its normal action, and which in operation maintains the throw, pull and all characteristics of the present trigger.

These purposes are accomplished by providing a trigger in the form of a compound lever and a slide which is moved into inoperative position when it is desired to fire semi-automatically. The trigger is so arranged that on its initial movement the rear-engaging portion moves rearwardly to withdraw the sear and on its continued movement the rear-engaging portion moves upwardly and is restored to neutral position. This restoration to neutral position during the continuous pull on the trigger is very desirable because of the rapid action of the breech bolt of the gun.

To these and other ends, the invention consists in the construction, arrangement and combination of elements described hereinafter and pointed out in the claims forming part of this specification.

A practical embodiment of the invention is illustrated in the accompanying drawing, wherein:

Fig. 1 is a view of the rear portion of a Browning gun, partly in side elevation and partly in section, showing the improved trigger in the neutral position.

Fig. 2 is a view with the rear end of the trigger raised.

Fig. 3 is a view with the rear end of the trigger raised and pivoted on the back plate.

Fig. 4 is a plan view of the trigger with the parts as shown in Fig. 1.

Figs. 5 and 6 are views in rear elevation showing the position of adjustment of the slide with respect to the trigger.

Referring to the drawing by characters of reference there is shown a portion of a machine gun of the Browning type including receiver A having a back plate B, lock frame C, and reciprocating breech bolt D which carries the sear E.

The trigger of the Browning gun is similar to the trigger F forming the subject of this invention except that it is a simple lever, whereas the improved trigger is a compound lever consisting of a front lever 5 and a rear lever 6 connected by a pivot pin 7. The front lever 5 is mounted on the lock frame by the conventional pivot pin 8 which is in the form of a pin or stud pivot 9 (Fig. 4) in the receiver to hold the lock frame in place. The cam lugs 10 (Fig. 3) on the forward end of the lever 5 and the complementary cam lugs 11 on the sear are the same as in the original gun, the lugs 10 being above and forwardly of the lugs 11.

The rear portion of the front lever 5 consists of a downwardly extending arm 12 which is inserted in the front part of a channel 13 in the rear lever 6 and when assembled thereto by the pivot pin 7 its bottom face is spaced from the floor of the channel. A set screw 14 threaded in the arm projects from the front face thereof and is adapted to engage the plate 15 of the lock frame to limit upward movement of the front arm of the lever 5 and determine the neutral position of the cam lugs 10. The arm 12 is provided with a recess for receiving a spring 16 and plunger 17, the plunger engaging the floor of the channel 13. The plunger is located rearwardly of the pivot pin 7.

The rear face of the arm 12 is formed with a notch 18 for receiving the head 19 of a latch 20 which is slidable mounted in the channel 13 of the rear lever 6. The latch is formed with a longitudinally extending recess 21 and a transverse slot 22 at the rear of the recess 21. A pin 23 fixed in the rear lever passes through the slot 22 to limit and guide movement of the latch and form a seat for a spring 24 which is housed in the recess 21. The front end of the spring is confined by a plug 25 which closes the front of the recess 21. A pin 26 is fixed in the rear lever and extends forwardly of the pin 23 and above the latch and assists in holding the latch in the channel.

The rear end of the latch is provided on its upper side with a cam 27, which, when the latch is in the forward position, is disposed directly in rear of the back plate B, the trigger passing through a slot 28 in the back plate as in the origi-
inal gun. A slide 29 replacing the trigger lock or safety catch of the original gun is similarly mounted and is movable transversely of the back plate. The left hand portion 30 of the slide has its lower edge in line with the upper edge of the back plate portion 31 as it has its lower edge above the upper edge of the slot. The right hand portion is in the form of a spring finger with a rib 32 for selectively engaging either of two recesses 33–34 to hold the slide in the position of adjustment. A rib 34 at the right end of the portion 30 serves as a thumb piece for moving the slide and in one position of adjustment of the slide its lower face 35 is disposed in the path of upward movement of the cam 27.

The front and rear levers 5 and 6 when assembled are normally in the relative positions shown in Fig. 1, the latch being slightly retracted by the arm 12 of the front lever, and the head 19 of the latch being engaged in the notch 18. When the trigger 19 is mounted in the lock frame through the pivot pin 8, the lower portion of the rear lever which extends through the slot 28 rests on the floor of the receiver and the cam lugs 10 are in the neutral position.

When it is desired to fire automatically the slide 29 is moved to the left so that no portion of it will be in the path of movement of the cam 27 on the latch when the rear end of the trigger is raised. In this position of adjustment of the slide the trigger functions in the same manner as the simple trigger of the original gun, the front and rear levers 5 and 6 being locked by the latch and moving as a unit on the pivot pin 8. Upon raising the rear end of the trigger the cam lugs 10 act on the cam lugs 11 of the sear to depress the sear. If the trigger is held in the firing position the gun will be fired automatically in the conventional manner every time that the breech bolt moves into battery, it being understood that the firing pin is cocked and the rear elevators to reengage it during reciprocation of the breech bolt.

When it is desired to fire semi-automatically the slide 29 is moved to the right to position the rib 34 in the path of movement of the cam 27 on the latch, when the rear end of the trigger is raised. Upon raising the rear end of the trigger the cam 27 is actuated by the rib 34 to retract the latch. During the first part of this movement the trigger moves about the pivot pin 8 and functions in the usual manner to depress the sear for the reason that the front and rear levers 5 and 6 are locked together by the head 19 of the latch 20. But as soon as the latch is completely withdrawn from the notch in the front lever the continued pressure on the rear end of the rear lever 6 causes this lever to move about the pivot pin 7 and during its final movement the latch is further retracted. When the rear lever has been moved to the top of the slot 28 it engages the back plate and continued pressure causes the lever to pivot on the back plate thereby lowering its front end and with it the pivot pin 7. Since the pivot pin 7 is engaged with the arm 12 of the front lever, the front lever will be swung about the pivot pin 8 in a reversed direction until the set screw 14 engages the plate 15. The front lever is now restored to the neutral position (Fig. 5) where it is incapable of depressing the sear as the breech bolt moves into battery. As the front lever is moved to neutral position the arm 12 is lowered so that the latch is positively prevented from moving forward to reestablish the connection so long as the rear lever is in the raised position.

Upon releasing the rear lever it will immediately drop due to gravity and the action of the spring-pressed plunger 17 and the latch reengages the front lever and a new cycle is now begun. A trigger pin 39 is now in the position shown in Fig. 1 and the trigger must be again raised in order to fire the next round.

I claim:

1. In a machine gun, a receiver having a floor and a back plate with a recess, a frame in the receiver, a trigger comprising pivotally connected rear and front levers, the rear lever having a channel and extending through the recess in the back plate, the front lever having a sear-engaging front portion and a sliding back portion and a depending arm at its rear, said arm inserted in the channel of the rear lever and having a notch in its rear face, a pivot pin connecting the arm and the rear lever, a pivot pin carried by the frame and mounting the front lever forwardly of the rear arm, an adjustable stop on the arm and engageable with the front lever, a cam lugs 10 carried in one direction, a spring-pressed plunger between the arm and the channel floor of the rear lever, a latch slideably in the channel of the rear lever and having a head receivable in the notch of the arm, a spring normally in engagement with the arm to maintain the front lever in neutral position and holding the head of the latch in the notch to couple the front and rear levers for unitary movement, a cam lug on the rear of the latch, and a slide in the channel floor movable in position to be engaged by the cam lug and effect retraction of the latch when the rear end of the trigger is raised.

2. In a machine gun, a receiver having a floor and a back plate with a recess, a frame in the receiver, a trigger comprising pivotally connected rear and front levers, the rear lever extending through the recess in the back plate and the front lever having a sear-engaging front portion, a pivot pin carried by the frame and mounting the front lever forwardly of its pivotal connection with the rear lever, a latch having a rib carried by the rear lever, a spring normally holding the latch in engagement with the front lever to maintain the front lever in neutral position and to couple the levers for unitary movement, a cam mounted on the head of the latch, and an inoperative position and into operative position to be engaged by the cam and effect retraction of the latch when the rear end of the trigger is raised, and a resilient member between the front and rear levers and normally tending to depress the rear lever.

3. In a machine gun, a receiver having a floor and a back plate with a recess, a frame in the receiver, a trigger comprising pivotally connected rear and front levers, the rear lever extending through the recess in the back plate and the front lever having a sear-engaging front portion, a pivot pin carried by the frame and mounting the front lever forwardly of its pivotal connection with the rear lever, a latch slidably carried by the rear lever, a spring normally holding the latch in engagement with the front lever to maintain the front lever in neutral position and to couple the levers for unitary movement, a cam on the back plate, a slide on the latch movable into inoperative position and into operative position to be engaged by the cam and effect retraction of the latch when the rear end of the trigger is raised.

4. In a gun, a support, a trigger comprising
5. In a gun, a support, a trigger comprising rear and front levers, a pivot pin connecting said levers, a pivot pin carried by the support and mounting the front lever forwardly of its pivotal connection with the rear lever, a latch slidably carried by the rear lever, a spring normally holding the latch in engagement with the front lever to maintain the front lever in neutral position and to couple the levers for unitary movement, cooperating means on the latch and support for retracting the latch when the rear end of the trigger is raised and a resilient member between the front and rear levers, and normally tending to separate the adjoining ends of the levers.

6. In a gun, a support, a trigger comprising rear and front levers, a pivot pin connecting said levers, a pivot pin carried by the support and mounting the front lever forwardly of its pivotal connection with the rear lever, a latch slidably carried by the rear lever, a spring normally holding the latch in engagement with the front lever to maintain the front lever in neutral position and to couple the levers for unitary movement, cooperating means on the latch and support for retracting the latch when the rear end of the trigger is raised, and a resilient member between the front and rear levers and normally tending to separate the adjoining ends of the levers.

7. In a gun, a support, a trigger comprising rear and front levers, a pivot pin connecting said levers, a pivot pin carried by the support and mounting the front lever forwardly of its pivotal connection with the rear lever, a latch slidably carried by the rear lever, a spring normally holding the latch in engagement with the front lever to maintain the front lever in neutral position and to couple the levers for unitary movement, cooperating means on the latch and support for retracting the latch when the rear end of the trigger is raised.

8. In a gun, a support, a trigger comprising rear and front levers, a pivot pin connecting said levers, a pivot pin carried by the support and mounting the front lever forwardly of its pivotal connection with the rear lever, a latch slidably carried by the rear lever and normally engaging the front lever to couple the rear and front levers for unitary movement, means on the latch and support for uncoupling the levers from unitary movement when the rear end of the trigger is raised.

9. In a gun, a support, a trigger comprising rear and front levers, a pivot pin connecting said levers, a pivot pin carried by the support and mounting the front lever forwardly of its pivotal connection with the rear lever, a latch normally coupling the levers whereby they are movable as a unit to displace the front lever from neutral to firing position, a slide having an inoperative position and movable into an operative position to effect retraction of the latch when the rear end of the trigger is raised and to uncouple the levers, and a surface on the support serving as a fulcrum for the rear lever whereby continued pressure on the rear lever effects reversal of the front lever to neutral position, and a resilient member between the front and rear levers and normally tending to separate the adjoining ends of the levers.

10. In a gun, a support, a trigger comprising rear and front levers, a pivot pin connecting said levers, a pivot pin carried by the support and mounting the front lever forwardly of its pivotal connection with the rear lever, a latch normally coupling the levers whereby they are movable as a unit to displace the front lever from neutral to firing position, a slide having an inoperative position and movable into an operative position to effect retraction of the latch when the rear end of the trigger is raised and to uncouple the levers, and a surface on the support serving as a fulcrum for the rear lever whereby continued pressure on the rear lever effects reversal of the front lever to neutral position.

11. In a gun, a support, a trigger comprising rear and front levers, a pivot pin connecting said levers, a pivot pin carried by the support and mounting the front lever, means normally coupling the levers whereby they are movable as a unit, and means operable during the final portion of the firing movement of the trigger to inoperative the coupling means.

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