Sept. 8, 1936. R. C. COUPLAND 2,053,264

TRIGGER MOTOR

Filed Oct. 2, 1934 2 Sheets-Sheet 1

Fig. 1.

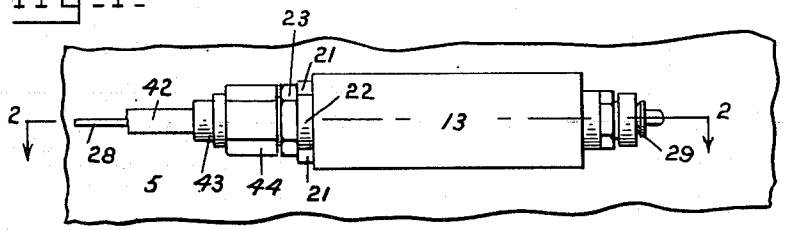


Fig. 2.

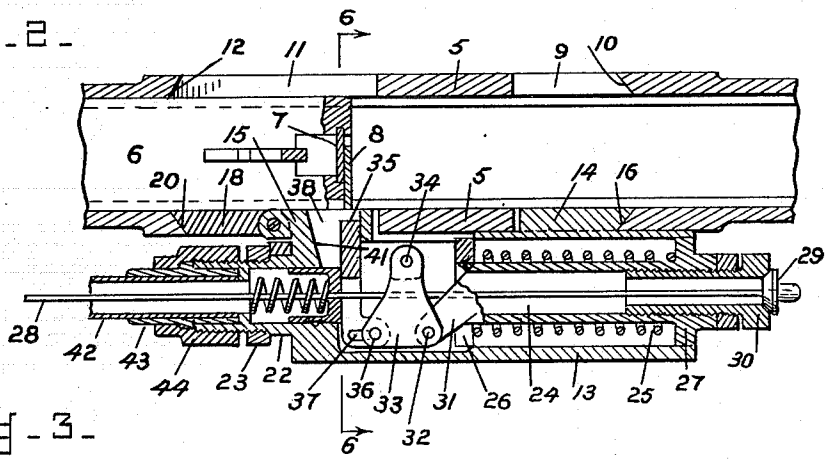


Fig. 3.

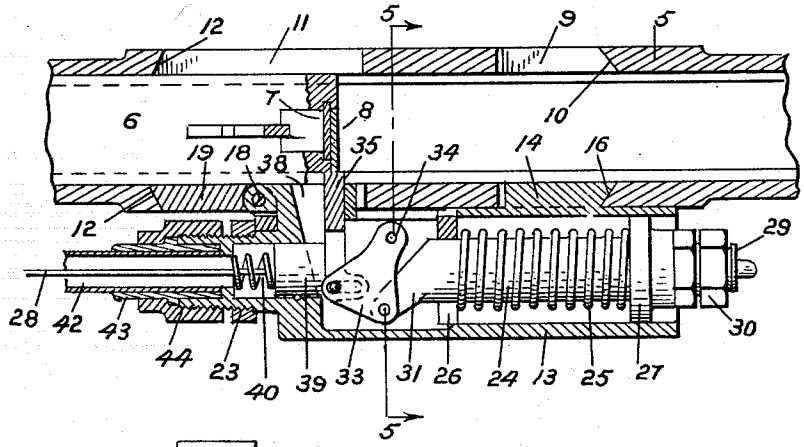
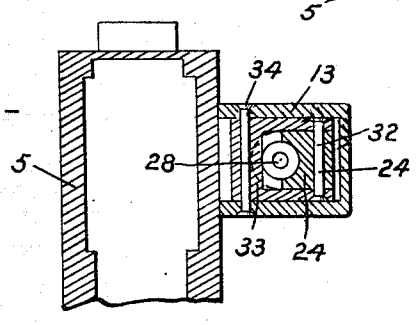


Fig. 5.



Inventor
Richard C. Coupland
By W. M. Roach
Attorney

Sept. 8, 1936. R. C. COUPLAND 2,053,264

TRIGGER MOTOR

Filed Oct. 2, 1934 2 Sheets-Sheet 2

Fig. 4.

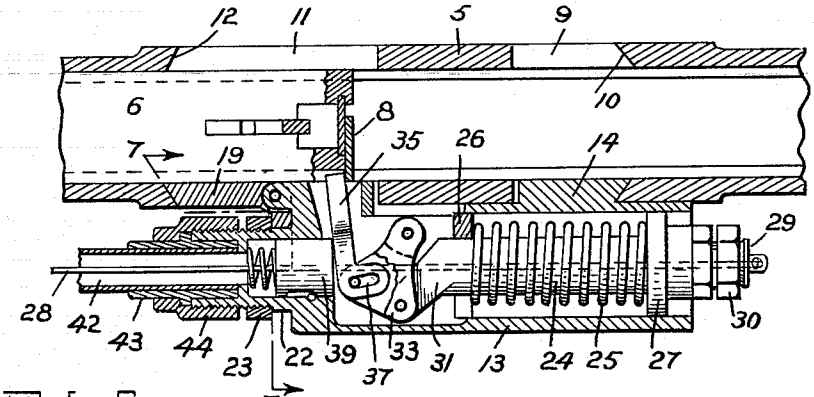


Fig. 6.

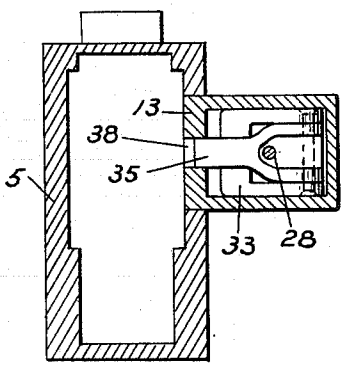


Fig. 8.

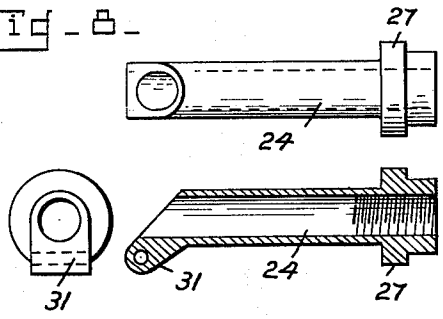
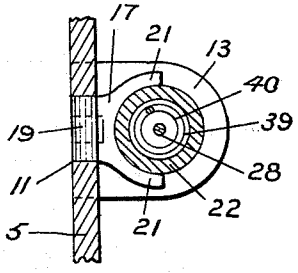


Fig. 8A. Fig. 8B.

Fig. 7.



Inventor
Richard C. Coupland
By W. N. Roach
Attorney

Patented Sept. 8, 1936

2,053,264

UNITED STATES PATENT OFFICE

2,053,264

TRIGGER MOTOR

Richard C. Coupland, United States Army, Norfolk, Va.

Application October 2, 1934, Serial No. 746,530

5 Claims. (Cl. 89—27)

(Granted under the act of March 3, 1883, as amended April 30, 1928; 370 O. G. 757)

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 motor such as is used in connection with a synchronized control system for guns which will permit the guns to be fired between the blades of a rotating propeller of aircraft.

The purpose of the invention is to provide a compact trigger motor of light weight, which may be readily applied to either side of the breech casing of a gun and which will be positive and reliable in operation.

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 a part of this specification.

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

Fig. 1 is a view in side elevation of the improved trigger motor mounted on a gun;

Fig. 2 is a sectional view on the line 2—2 of Fig. 1;

Figs. 3 and 4 are views similar to Fig. 2 and showing other positions of the parts;

Fig. 5 is a sectional view on the line 5—5 of Fig. 3;

Fig. 6 is a sectional view on the line 6—6 of Fig. 2;

Fig. 7 is a sectional view on the line 7—7 of Fig. 4;

Fig. 8 is a plan view of the plunger;

Fig. 8A is an end elevation thereof;

Fig. 8B is a longitudinal section thereof.

Referring to the drawings by characters of reference there is shown a portion of a machine gun including a breech casing having side walls 5—5 between which a breech bolt 6 is reciprocally mounted. The breech bolt is provided with the usual sear 7 which is adapted to be moved to releasing position by a sear slide 8.

The side walls 5 of the breech casing are each provided with a pair of slots or apertures, the rear aperture 9 having its rear face 10 inclined forwardly from inside to outside of the breech casing and the front aperture 11 having its front face 12 inclined rearwardly from inside to outside of the breech casing. The faces 10 and 12 are therefore outwardly convergent or inwardly divergent.

A trigger motor housing 13 adapted to be mounted on and bear against either one of the side walls 5 of the breech casing is formed with a pair of lugs 14 and 15 respectively entering the apertures 9 and 11. The lug 14 has an inclined face 16 complementary to and adapted to bear against the inclined face 10 of the rear aperture 9.

The lug 15 carries a bell crank lever 17 (Fig. 2) mounted on a pivot pin 18 and forming the subject of a separate application. One arm 19 of the lever corresponds to the lug 14 and has an inclined face 20 complementary to and adapted to bear against the inclined face 12 of the front aperture 11. The other arm 21 (Figs. 1 and 7) of the lever is bifurcated to straddle a nipple 22 on the front end of the housing 13. A nut 23 threaded on the nipple bears against the bifurcated arm 21, holds it immovable against the housing and thereby forces the inclined faces 16 and 20 of the housing into engagement with the inclined faces 10 and 12 of the side wall 5. A half turn of the nut 23 frees the bell crank lever sufficiently to enable the housing to be detached by an outward movement of its front end. The attachment of the housing to the breech casing is accomplished by reversing this operation.

Within the housing 13 there is a reciprocally mounted plunger 24 and a spring 25, embracing the plunger and confined between a washer 26 seated in the housing and a collar 27 on the plunger. The spring normally maintains the plunger in the position shown in Fig. 2. An impulse transmitting cable 28 passes through and is attached to the plunger by means of a washer 29 and an adjusting screw 30, the screw being threaded to the plunger in the manner more fully shown in my prior Patent No. 1,770,125 of July 8, 1930.

The front end of the plunger is formed with an inclined arm 31 which is connected by a pivot pin 32 to a lever 33. The lever is disposed within the housing 13 and is mounted on a pivot pin 34. A trigger 35, substantially parallel with the lever, is connected thereto by a pivot pin 36 positioned opposite the pivot pin 32. The pin 36 passes through an elongated aperture or apertures 37 in the trigger whereby it is possible for the trigger to be moved transversely of the housing 13 without displacement longitudinally thereof when the lever is rocked about its pivot pin 34 as seen in Fig. 3. The lever and trigger are arranged to be moved without interfering with the impulse cable 28 and to this end they are preferably bifurcated as clearly shown in Fig. 6.

The free end of the trigger passes through an aperture 38 in the lug 15 and is arranged to

strike the sear slide 8 when the trigger is moved inwardly towards the breech casing. A plunger 39 mounted in the housing is acted on by a spring 40 and normally holds the trigger in a position transversely of the housing 13 with its inner free end against the rear wall 41 defining the aperture 38.

The front wall of the aperture 38 is inclined to permit pivotal displacement of the trigger against the action of the plunger. The provision for this displacement is necessary because the trigger is reciprocated at a different frequency than the normal rate of firing of the gun, and if it is in the inward firing position when the bolt of the gun is arriving in battery, the forward face of the sear slide 8 will strike the side of the trigger and cause it to yield (Fig. 4). Furthermore when firing is discontinued the impulse cable is held to maintain the plunger 39 in the forward position thereby positioning the trigger in the path of the sear slide where it will be rotated by the sear slide as the breech bolt arrives home after firing the last shot. The trigger will then be in safe or inoperative position and the gun cannot be fired until the impulse cable is released.

The impulse cable is sheathed in a tube 42 which is anchored in a socket member 43 extending into the nipple 22 of the housing 13. The socket member is retained by a nut 44 threaded on the nipple.

The parts are normally in safe position in Fig. 4. When the impulse cable is released, the spring 25 moves the plunger rearwardly and the plunger acts through the lever 33 to move the trigger outwardly to the position shown in Fig. 2. When the impulse cable 28 is now pulled, the plunger 24 is moved forwardly and the lever 33 moves the trigger inwardly where it strikes the sear slide 8 and fires the gun as shown in Fig. 3.

I claim:

1. In a trigger motor, a housing having an aparture in its side wall, a plunger in the housing, a lever pivotally mounted in the housing and pivotally connected to the plunger, a trigger having a pivotal and sliding connection with the lever, the free end of the trigger arranged to move through the aperture in the housing, means normally urging the trigger towards the lever, and a cable passing through the trigger and lever and connected to the plunger.

2. In a trigger motor, a housing having an aperture in its side wall, a plunger, a spring normally urging the plunger in one direction, a cable for retracting the plunger, a lever pivotally mounted in the housing and pivotally connected to the plunger, a trigger having a pivotal and sliding connection with the lever, the free end of the trigger arranged to move through the aperture in the housing, and a resilient means carried by the housing and normally moving the trigger towards the lever.

3. In a trigger motor, a housing having an aperture in its side wall, a plunger, a spring normally urging the plunger in one direction, a cable for retracting the plunger, a lever pivotally mounted in the housing and pivotally connected to the plunger, a trigger having a pivotal and sliding connection with the lever, the free end of the trigger arranged to move through the aperture in the housing, and a resilient means normally moving the trigger towards the lever.

4. In a trigger motor, a housing having an aperture in its side wall, a lever pivotally mounted in the housing, means for rocking the lever, a trigger having a slidable pivotal connection with the lever, the free end of the trigger arranged to move through the aperture in the housing, and resilient means mounted in the housing and normally moving the trigger towards the lever.

5. In a trigger motor, a housing having an aperture in its side wall, a lever pivotally mounted in the housing, means for rocking the lever, a trigger having a slidable pivotal connection with the lever, the free end of the trigger arranged to move through the aperture in the housing, and resilient means normally moving the trigger towards the lever and holding it against the housing.

RICHARD C. COUPLAND.