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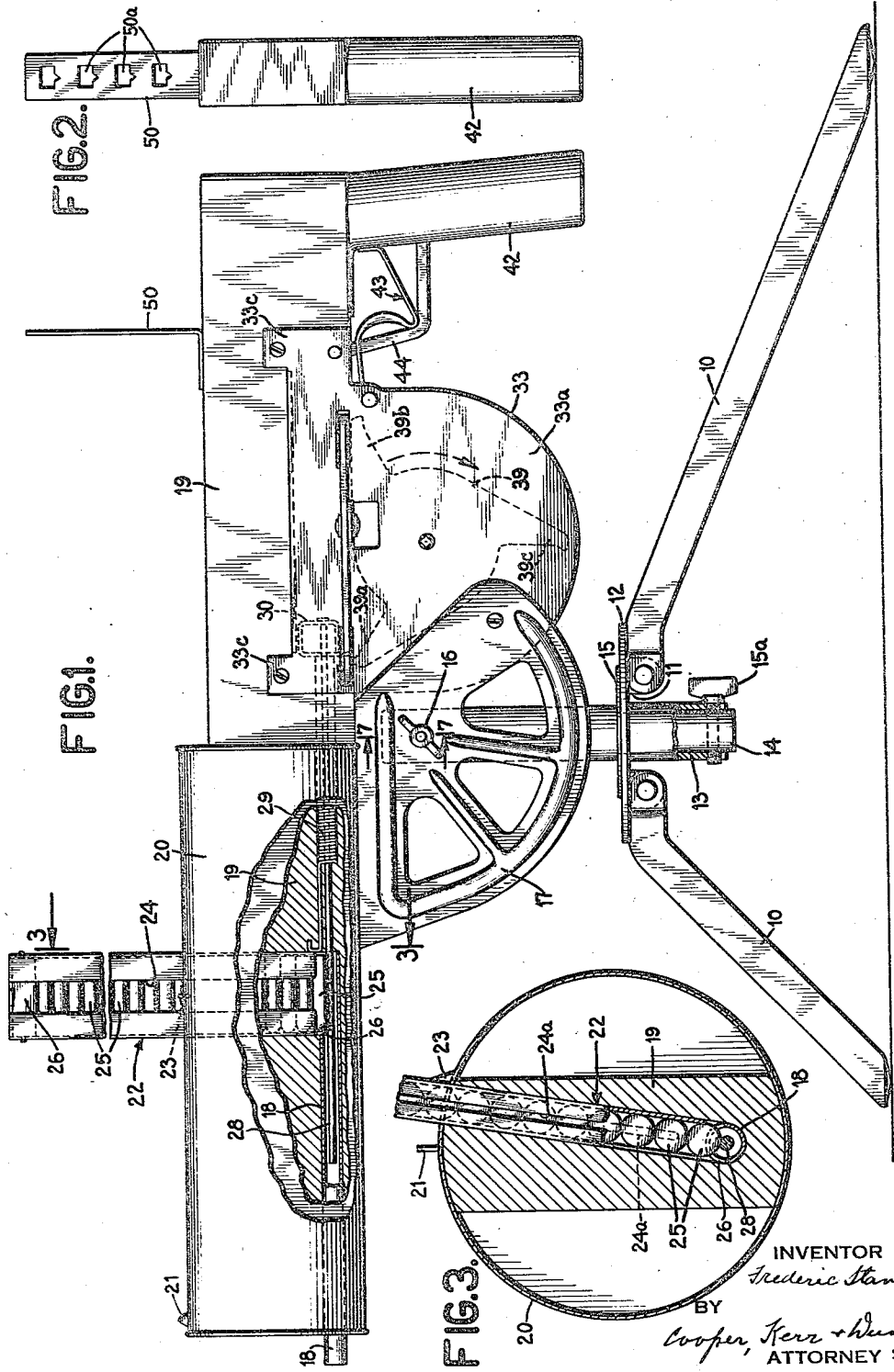
F. STANLEY

2,170,221

TOY MACHINE GUN

Filed March 11, 1938

2 Sheets-Sheet 1



INVENTOR  
*Frederic Stanley*  
BY  
*Cooper, Kerr & Dewhaver*  
ATTORNEYS

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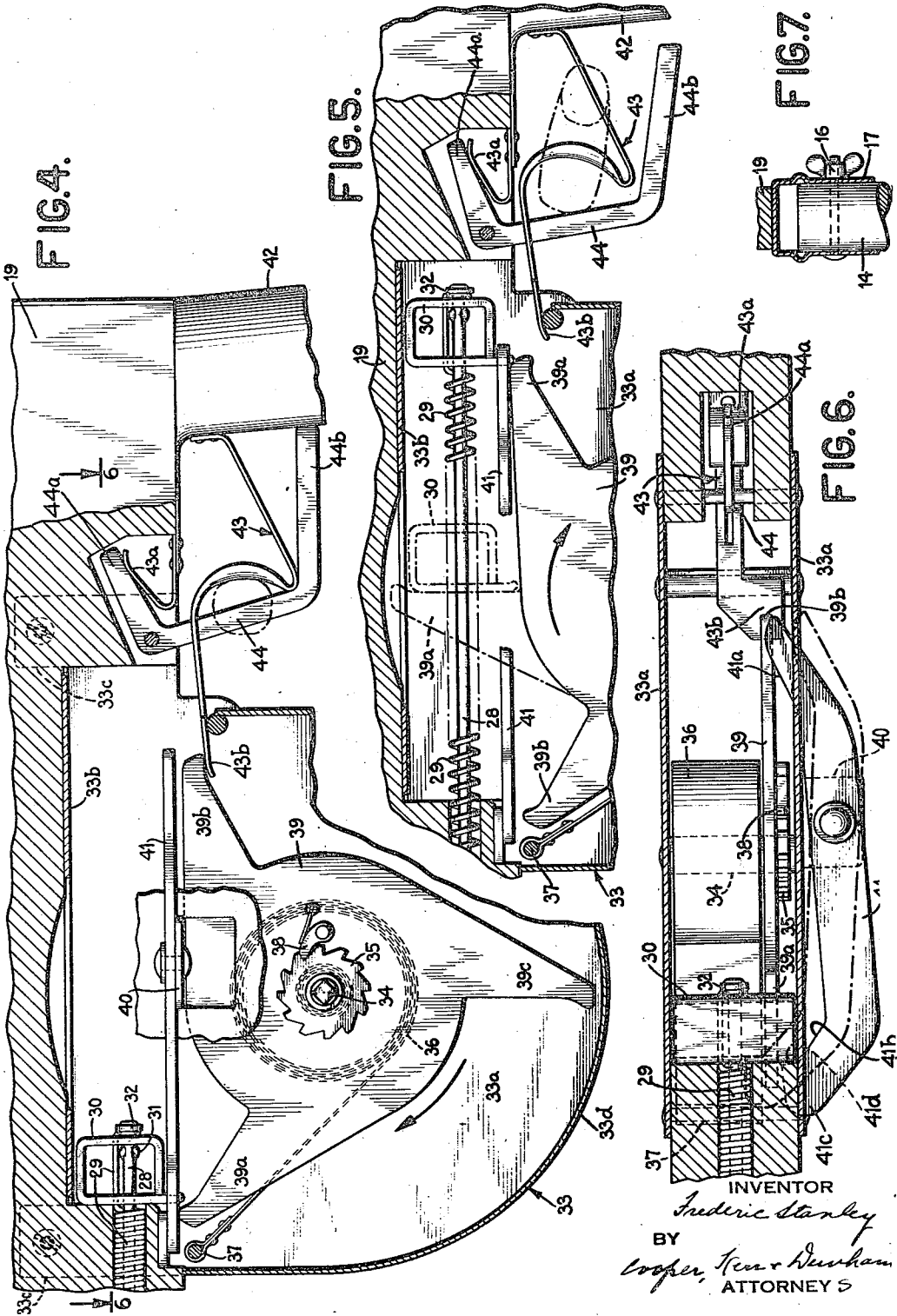
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# UNITED STATES PATENT OFFICE

2,170,221

## TOY MACHINE GUN

Frederic Stanley, New York, N. Y.

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8 Claims. (Cl. 124—29)

This invention relates to improvements in toy machine guns and more particularly to toy machine guns of the spring actuated type which are adapted to fire a plurality of toy bullets in succession and to thus simulate burst firing of actual machine guns.

Toy guns as heretofore proposed, have been of a type adapted for relatively slow firing and other toy spring guns have been proposed in which one spring effected the firing and another more powerful motor spring cocked or stressed the firing spring and then released it. Such latter proposed toy guns did not attain success or commercial use because the more powerful motor or cocking spring acted to re-stress the firing spring before the firing pin or plunger had completed its traverse of firing movement. Other disadvantageous features of former guns included the provisions of a firing pin structure or assembly of such construction that the firing pin had a relatively short stroke of movement. This feature was disadvantageous in that the range was thereby considerably restricted.

The present invention relates to and has for one of its objects the provision of a toy machine gun of the spring operated type employing a firing spring and a motor spring for cocking or stressing it with novel means for correlating and controlling the interrelation of spring actions and firing pin actions whereby with retained depression of the trigger, bullets or projectiles may be discharged automatically in rapid succession to simulate burst firing.

A further object of the present invention resides in the provision of an improved and simple safety device and trigger arrangement for a toy machine gun.

A further object of the present invention resides in the provision of a toy machine gun which will be simple and inexpensive to manufacture and assemble and one which is not likely to get out of order when in use.

A further object of the present invention resides in the provision of a firing pin assembly for a toy machine gun and means for operating it whereby long traverse of firing pin movement may be obtained thereby increasing the range of the gun.

In the drawings:

Figure 1 is a side elevational view of the gun with certain parts broken away to show the interior construction;

Fig. 2 is a rear elevation of the stock portion showing the rear sight;

Fig. 3 is a cross-sectional detail view taken on

line 3—3 of Fig. 1 and showing the bullet clip or magazine in position in the gun;

Fig. 4 is an enlarged detail side elevational view showing details of the actuating mechanism and portions of the firing pin assembly. In this view certain cover parts are removed and other parts are shown in section to show the interior construction. This view shows the parts in stopped position;

Fig. 5 is a view generally similar to Fig. 4, but showing the parts in firing relation with the safety catch in "off" position and with the trigger pulled. This view also by dotted lines shows the actuating dog in intermediate position;

Fig. 6 is a top plan detailed view substantially on line 6—6 of Fig. 4 and showing the oscillator or escapement control mechanism in different positions; and

Fig. 7 is a fragmentary detail view of the quadrant frame taken along lines 7—7 of Fig. 1.

Generally my improved toy machine gun comprises a tripod or stand, which permits variable elevation and variable traverse of the gun. The gun includes the usual stock, grip, and trigger with the main barrel carried by the stock and surrounded by a false barrel simulating the water jacket of an actual machine gun. The trigger is provided with a safety device to prevent accidental firing. The projectiles or bullets are fed automatically in succession into the main barrel from a replaceable clip or magazine. Within the barrel is a firing pin assembly which is normally maintained in advanced position by a coiled tension spring. A hand wound motor spring is disposed upon the stock which is adapted to rotate a spider-shaped actuating means or dog. When the trigger is operated the actuating means or dog is released and it is then spring driven by the more powerful motor spring to retract the firing pin assembly and stress its firing spring, whereupon a bullet drops in front of the firing pin. Further movement of the actuating means releases the firing pin, allowing it to move under its own spring action and eject the bullet from the barrel. Before the firing pin assembly is released for firing movement, latching means is displaced into the path of the actuating means to block movement of the actuating means until the firing pin substantially reaches its forward position. Upon the firing pin reaching such forward position or just before it reaches such position, the actuating means is again released and the operations repeat until the trigger is released. The details of the gun will now be described.

### Tripod

The toy machine gun is provided with a supporting tripod including legs 10 (Fig. 1), which are pivotally supported upon depending brackets 11 from a plate 12 having an annular tube 13 secured or integral with the plate and extending downwardly therefrom. The tube 13 affords support for a post 14. Post 14 has a suitable shoulder plate 15 secured thereto to overlie the plate 12 and afford vertical support for the post and gun carried thereby. A thumb screw 15a secures the parts in assembled relation and a transverse slot is provided in the tube 13 to limit the extent of traverse. If desired, the shoulder plate 15 and the underlying plate 12 may be graduated to show the extent of traverse of the gun. The foregoing described construction permits traverse of the gun about the tripod support. The tripod legs may be folded up when desired or may be removed from the post when desired.

### Quadrant

To provide for variable elevation, the post 14 is bored to receive a transverse bolt and wing nut generally designated 16 (see also Fig. 7). This wing nut assembly 16 is adapted to clamp a quadrant frame 17 in any desired angular position with respect to the post. The nut may be loosened to permit moving of the gun during firing.

### Gun

The gun proper is secured in any desired manner to the quadrant frame as by screws extending through the top of the quadrant frame 17 into wooden stock 19. In Fig. 1, 18 designates the main barrel which is disposed in the stock 19. The barrel 18 at its forward end may, if desired, be surrounded by a cylindrical part 20 adapted to resemble the cooling jacket of an actual machine gun. The cooling jacket 20 may be provided with a forward sight 21 which sight may be struck up from the sheet metal of the cooling jacket or otherwise formed. The cooling jacket and stock are suitably apertured to secure a replaceable clip or magazine designated 22. This clip may be made of sheet metal and preferably has a stop lug 23 thereon to stop the clip in proper position. The clip may have an open slot at one side as shown at 24 (Fig. 1) to show the number of bullets therein. The bullets or projectiles 25 may be of wood or rubber or of any other suitable material. If desired, a sliding gravity weight 26 may be employed to aid the descent of the bullets in the clip. Such weight may be guided in suitable slots in the front and rear edges of the clip. Such slots limit the descent of the weight in the clip and permit withdrawal of the weight with the clip. The bottom of the clip or magazine is opened to permit the descent of the bullets through a slot 26a in the upper half of the main barrel 18. Disposed within the main barrel 18 is a firing pin 28 which in forward position (stop position) assumes the position of Fig. 1. This firing pin is drawn to this position by a firing spring 29 which may be hooked at its forward end to the stock as shown in Fig. 1. The firing pin may be slidably guided to the rear or to the right of the magazine by extending the stock material into proximity with the pin. The rear end of the firing pin has secured to it a firing butt 30 preferably having the configuration shown in Fig. 4 and secured between shoulders 31 on the firing pin 75 and a nut 32 which also affords a rear anchorage

for the firing spring 29. The firing pin and firing butt assembly may be termed a "firing pin assembly".

Secured to the stock by suitable fastenings, such as by screws, is a main spring housing 33. Such housing preferably is a sheet metal structure comprising side plates 33a, a cross plate 33b, tab or ear portions 33c and a bottom closing strip or band 33d. The side plates 33a form a pivotal support for a winding spring arbor 34, preferably having a squared end to receive the usual winding key not shown. The arbor 34 has a ratchet 35 and a main motor spring 36 secured thereto. The opposite end of the motor spring 36 is secured to a spring post 37. Cooperating with the ratchet 35 is a combined winding and driving pawl 38 which is pivoted upon an actuating member or dog 39. The actuating dog is preferably of the three-arm type to provide compactness of construction. The three arms of the actuating dog are respectively designated 39a, 39b and 39c and preferably have the end configuration shown in Fig. 4.

### Oscillator or escapement

Pivoted on a bracket 40 fixed to one of the side plates is an oscillator or escapement member 41. This oscillator has the configuration shown in plan in Fig. 6 and includes a rear camming edge 41a, a front camming edge 41b and a latching portion 41c provided with a shoulder 41d, which serves as a limit stop for the firing pin butt 30.

### Trigger, grip and safety device

The grip or handle 42 depends from the rear of the main stock. The trigger 43 is preferably a strip of flexible metal shaped as shown in Fig. 4. Pivoted to the stock is an automatic safety device 44 having a tail 44a overlying a resilient extension 43a from the trigger and having another extension 44b underlying the trigger. The resilience of part 43a normally keeps part 44 in the position shown in Fig. 4. The relations and proportions of the safety device and trigger are such that in order to obtain access to the trigger to operate the same, the safety device must first be manipulated by depressing part 44b from the position shown in Fig. 4 to the position shown in Fig. 5. This will afford space in front of the trigger for the insertion of the trigger finger between the safety device 44 and trigger, thereafter the trigger may be operated. It will be understood that with the parts in the position shown in Fig. 4 there is insufficient space for the insertion of the finger to operate the trigger. (Note dotted line finger outline on this view.) After firing upon removal of the finger, the safety device automatically resumes the safety position shown in Fig. 4. Restoration of the safety device to this position is effected by the resilient member 43a.

### Rear sight

Any suitable rear sight may be provided. Such sight may comprise a bracket 50 (see Fig. 2) having a plurality of sight openings 50a affording different sight elevations.

### Operation

One of the clips 22 is first loaded, then reversed and inserted in the gun in the position shown in Fig. 1. The hand wound main motor spring 36 is then wound up by hand by the usual spring key. The user then points the gun, manipulates the safety latch and inserts the trigger 75

finger ready to pull the trigger. The various parts are now in the relation as shown in Fig. 4, except that in this figure the safety latch 44 is shown in safety position. The trigger extension 43b prevents clockwise motion of the actuating dog, such extension 43b intercepting arm 39b. On pulling the trigger to the Fig. 5 position the actuating means or dog is released and moves clockwise under the power of the main motor spring as indicated by the arrow. The dog 39a moves from the Fig. 4 position through the dotted line position (see Fig. 5) to the full line position (Fig. 5). This motion of the actuating means or dog stretches the firing spring 29, retracts the firing pin assembly, including the firing pin and allows a bullet to drop from the clip in front of the firing pin when the firing pin is fully retracted. It will be appreciated that the hand wound motor spring 36 is more powerful than the firing spring 29. While the firing pin assembly is moving rearwardly under the power of the main motor spring the firing pin butt 30 will engage the rear camming edge 41a of the oscillator or escapement and cam it from the full line position (Fig. 6) to the dotted line position. Clockwise rotation of the actuating dog continues until a dog arm such as 39a assumes the relation shown in Fig. 5. A slight further movement will permit the dog arm to clear the firing butt whereupon the firing pin assembly may be drawn forward by the now stretched firing pin 29. It will be noted that before the firing pin assembly moves forward that the latching nose 41c of the oscillator 41 will be in the path of a following arm of the actuating dog and prevent further clockwise movement of such actuating dog (note the dotted line position of the oscillator in Fig. 6). However, upon forward movement of the firing pin butt under the action of the firing spring, such butt will ultimately engage the forward camming edge 41b of the oscillator and rock it out from the dotted line position (Fig. 6) to the full line position so that the latching nose of the oscillator will again be displaced out of the path of the next arm of the actuating dog. The foregoing operations will then repeat provided the trigger is maintained tripped.

Burst firing obviously may be secured with the above described mechanism so that actual machine gun rapid fire may be simulated. Firing may be terminated at any time by release of the trigger which will allow the extension 43b to block motion of the actuating dog. The arrangement described provides comparatively long movement for the firing pin, thus affording good range. The inter-control between the firing pin assemblage and actuating dog which is provided for by the oscillator or escapement member 41 provides for proper succession of operations and in particular, provides means to prevent the actuating dog acting to re-stress the firing spring pin or to return the firing spring assemblage to cocked position prematurely. With this inter-control, the firing pin always makes its complete traverse to the right to eject a bullet before the actuating dog is released to again re-cock the firing pin assembly.

By properly proportioning the parts, increased movement and increased range may be attained.

What I claim is:

1. A toy machine gun including in combination a barrel means for automatically feeding a series of projectiles thereinto, a firing pin for ejecting bullets in succession from the barrel,

said firing pin having resilient means for advancing it for firing each bullet, a hand wound motor spring with actuating means driven thereby including means for first cocking the firing pin, and stressing its spring, then releasing the firing pin to eject a projectile and for thereafter repeating the aforesaid operations and interlocking means between said firing pin and actuating means to lock the actuating means after each cocking operation and to thereafter release the actuating means upon the firing pin means substantially completing the traverse upon firing a projectile.

2. A toy machine gun for firing a burst of projectiles in succession from a barrel to which a plurality of projectiles are automatically fed, comprising a spring actuated firing pin assembly, a hand wound motor spring, trigger released actuating means driven by the motor spring for automatically and in succession cocking the firing pin, releasing it and re-cocking it in repeated automatic succession to afford burst firing, said actuating means and firing pin assembly having inter-controlling means therebetween positioned by the firing pin assembly for latching the actuating means with the firing pin assembly in one relation and releasing such latching means upon the firing pin assembly reassuming a different relation.

3. The invention according to claim 2 wherein the inter-controlling means between the firing pin assembly and the actuating means comprises a pivotally mounted oscillator escapement member having camming edges cammed by the firing assembly when the latter moves towards rear-most position and towards foremost position, said member including latching means for latching and unlatching the actuating means.

4. A toy machine gun including a barrel, a resiliently actuated firing pin guided for reciprocation within the barrel for ejecting a bullet therefrom upon each forward stroke, means for repeatedly and automatically cocking and releasing said firing pin, comprising a power spring driven rotatable actuating member, and inter-control means between said member and firing pin, including means to block rotation of the actuating member by and upon rearward retraction of the firing pin and means to release the actuating member by and upon the return of the firing pin to forward position.

5. A toy machine gun according to claim 4, wherein a removable bullet clip is provided for a plurality of bullets, said barrel having a slot through which the bullets are fed in succession from the clip.

6. The invention according to claim 4, wherein the actuating member comprises a multiple armed dog and wherein the firing pin is provided with a firing pin butt which is directly intercepted by, actuated by and released from successive arms of the dog upon rotation of said dog.

7. A toy machine gun including a barrel having a reciprocable firing pin therein with resilient means for imparting firing movement thereto, means for repeatedly stressing said resilient means and for repeatedly cocking and repeatedly automatically releasing the firing pin, said means comprising a power spring driven multiple armed dog and a firing pin butt directly carried by the firing pin and positioned to be intercepted directly by each arm of the dog, to be moved thereby and to be released therefrom upon rotation of the dog.

8. A toy machine gun with a spring actuated reciprocable firing pin, a firing pin butt directly carried by the firing pin adjacent one end thereof, a multiple arm actuating dog having power spring means for rotating it, trigger means extendable into the path of the dog arms and withdrawable out of their path, each of said dog arms being also disposed to directly intercept the firing pin butt, retract it and then release it upon spring rotation of the dog when the latter is released by the trigger whereby direct cocking action and long traverse of movement of the firing pin is secured.

FREDERIC STANLEY.