

Aug. 3, 1937.

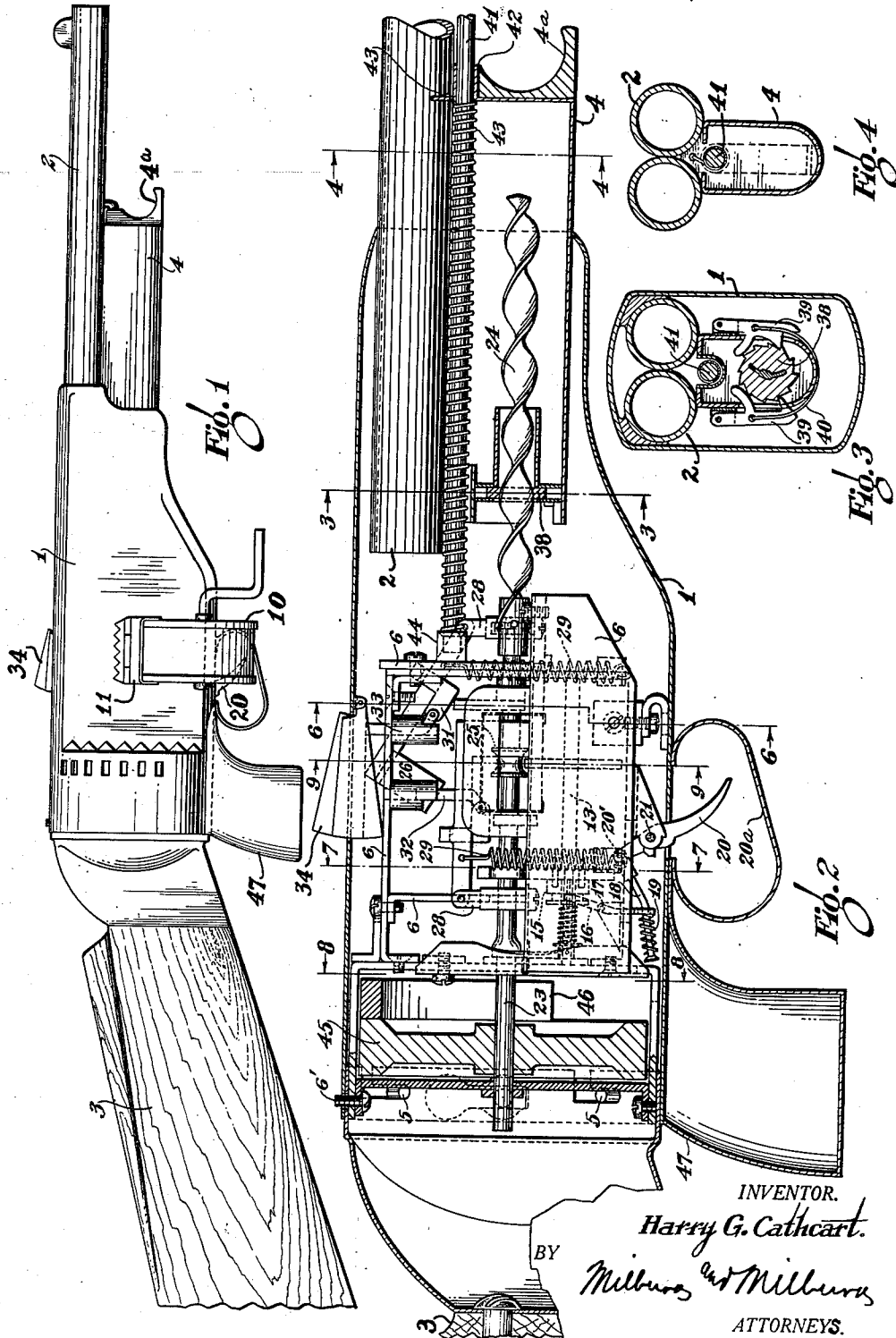
H. G. CATHCART

2,088,894

TOY CAP GUN

Filed May 11, 1933

2 Sheets-Sheet 1



INVENTOR.

Harry G. Cathcart.

BY

Millburn and Millburn

ATTORNEYS.

Aug. 3, 1937.

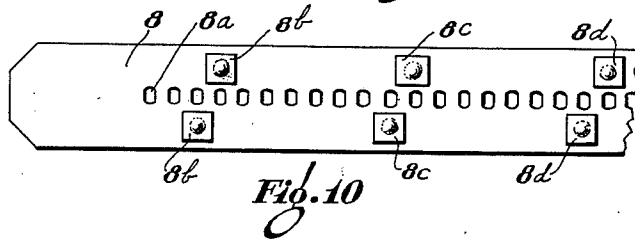
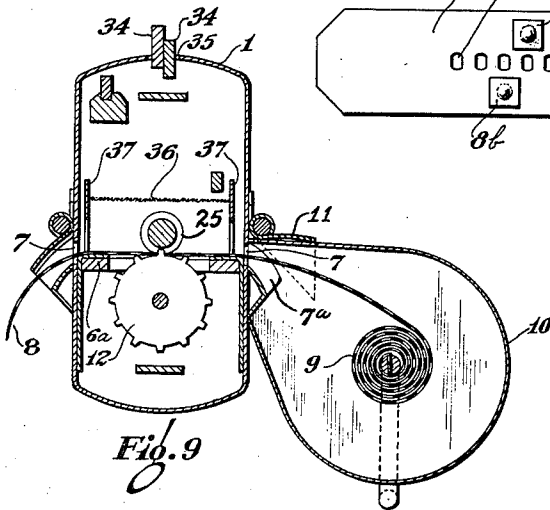
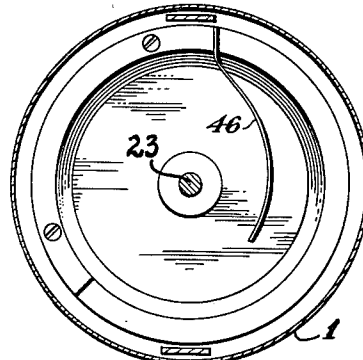
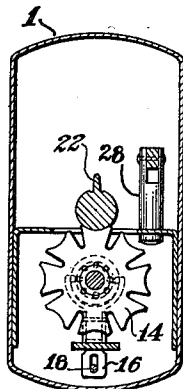
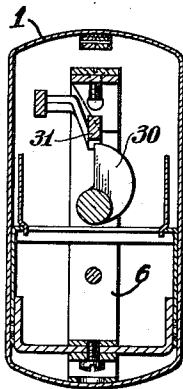
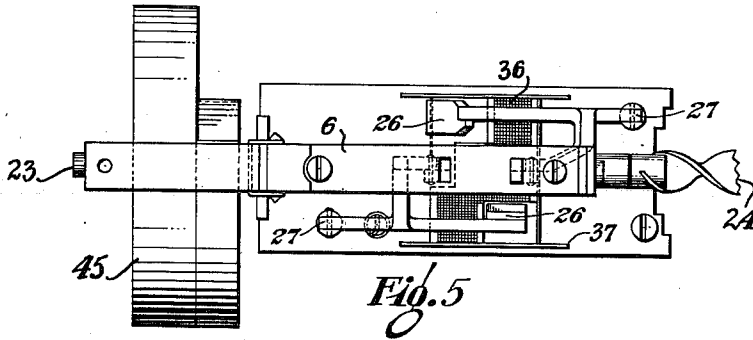
H. G. CATHCART

2,088,894

TOY CAP GUN

Filed May 11, 1933

2 Sheets-Sheet 2



INVENTOR.
Harry G. Cathcart.
BY
Millburn and Millburn,
ATTORNEYS.

UNITED STATES PATENT OFFICE

2,088,894

TOY CAP GUN

Harry G. Cathcart, Cleveland, Ohio

Application May 11, 1933, Serial No. 670,531

1 Claim. (Cl. 42—57)

This invention relates to improvements in a toy cap gun.

More specifically, this invention relates to a type of toy cap gun having means for feeding a succession of caps, and means for firing the same; together with a single means for operating the cap-feeding and cap-firing means, these parts being so constructed and arranged that by manipulation of the single operating means, the caps can be fired in rapid succession.

One object consists in providing a combination mechanism, as just referred to, in which there is included a fly wheel in conjunction with the single operating means whereby the rapidity of the succession of cap percussions can be increased.

More specifically, the object is to devise a toy cap gun of the type above referred to, in which the single operating means for the feeding and firing mechanism is of the pump type including a spiral rack as part of such operating means.

Another object consists in providing means for temporarily releasing the cap-feeding means so as to permit insertion of the cap strip and proper positioning of the same with respect to the firing hammers so as to insure proper registry of the caps with the hammers for the firing operation.

Another object consists in devising a multiple fire toy cap gun of the type above referred to, in which a strip of caps is fed laterally through the firing chamber and in which the cap-feeding and cap-firing means may be operated by the one hand of the user.

Another object consists in devising a multiple fire toy cap gun of the type above referred to, in which there is provided also a means for impelling the smoke of the cap fire forwardly toward the front end of the gun.

A still further object consists in providing safety means to prevent discharge of sparks from the firing chamber.

Another object consists in providing a magazine within which a roll of the cap strip may be stored and from which the same may be withdrawn for feeding through the firing chamber during operation of the gun.

Other objects will appear from the following description and claims when considered together with the accompanying drawings.

Fig. 1 is a side elevation of my improved gun; Fig. 2 is a longitudinal sectional view of the same;

Figs. 3 and 4 are sectional views taken on lines 3—3 and 4—4, respectively, of Fig. 2;

Fig. 5 is a top plan view of the firing mechanism;

Fig. 6 is a sectional view taken on line 5—5 of Fig. 2 and illustrates especially the cam mechanism for raising the firing hammers;

Fig. 7 is a sectional view taken on line 7—7 of Fig. 2 and illustrates the star wheel mechanism for giving intermittent rotation to the sprocket which advances the cap strip through the firing chamber;

Fig. 8 is a view taken on line 8—8 of Fig. 2 and indicates the fly wheel and the fan member carried thereby;

Fig. 9 is a view taken on line 9—9 of Fig. 2 and illustrates the manner in which the cap strip is drawn by the sprocket from the magazine and is fed through the firing chamber; and

Fig. 10 is a plan view of a portion of the perforated cap strip.

The particular form of gun here illustrated is of the double barrel type with two firing hammers and for which there is provided a double form of cap strip. It is to be understood, however, that the same principle of invention may be embodied in a gun having but a single barrel and a single firing hammer with a single form of cap strip.

The present gun herein illustrated comprises the firing chamber which is indicated in a general way by reference numeral 1 from which projects the double barrel 2 and which is provided with the holster 3. According to the principle of the present invention, the caps are carried by a strip of paper or other suitable material which is adapted to be fed through the firing chamber by being introduced at the one side and discharged from the other side thereof. The mechanism for feeding the cap strip through the firing chamber is enclosed therewithin as is also the mechanism for firing the caps. The cap-feeding and cap-firing mechanisms are both operated by a single means which is here disclosed in the form of a pump 4 which is reciprocatably mounted at the front part of the gun. This brief statement will serve to afford an understanding of the general combination of the present invention.

The holster 3 is removably attached to the rear end of the wall of the firing chamber 1 by means of a bayonet lock 5 or any other suitable form of connection. The cap-feeding and cap-firing mechanisms are mounted as a unit upon a suitably constructed frame which is indicated in a general way by reference numeral 6, this unit of combined operating mechanism including the

spiral rack which affords operative connection with the pump 4, as will be hereinafter more fully explained. When this unit of mechanism is inserted into the firing chamber, the screw 6' which is carried by the unit frame, is inserted through an aperture at the rear end of the wall of the firing chamber 1, and the insertion of the edge of the holster between the unit frame and the wall 1 at the opposite side, will hold the screw 6' in such position. Screw 6' serves as one of the pins of the bayonet lock.

The side walls of the firing chamber 1 are provided with oppositely disposed openings 7 through which the cap strip 8 may be extended. For this purpose, the cap strip may have its forward end slit or otherwise provided with means to facilitate insertion of the same into the strip-feeding mechanism. The cap strip may be housed in the form of a reel 9 within the magazine 10 which has a mouth portion adapted to engage over the sides 7^a of the window 7 and to be maintained in such position by a clamping closure member 11 which is hinged to the side of the wall 1 and is adapted to be turned down over the mouth portion of the magazine 10. Snap-engaging, integrally formed studs and openings or recesses may be formed in the engaging portions of these members so as to better maintain the parts in such assembly.

The means for feeding the cap strip 8 through the firing chamber 1, comprises the sprocket 12 which is fixedly mounted upon the shaft 13 which in turn is suitably supported within the frame structure 6. The teeth of sprocket 12 are adapted to engage in the sprocket holes 8^a which are arranged along the middle line of the strip 8. Upon the two sides of the strip 8 are arranged the pairs of caps 8^b, 8^c, 8^d, etc. The caps of each pair, as for instance the caps 8^b, are spaced longitudinally along the strip 8. In the present illustration, the caps of each pair are spaced apart three-sixteenths of an inch ($\frac{3}{16}$ "), the successive pairs are placed at intervals of one and one-half inches ($1\frac{1}{2}$ ") along the strip, and the hammers are spaced fifteen sixteenths of an inch ($\frac{15}{16}$ ") from center to center of each other. The shaft 23 goes through one complete rotation while the hammers are being raised and lowered and the star wheel makes but one-eighth of a rotation during the same period. Each such movement of the star wheel is effective in moving the strip three sixteenths of an inch ($\frac{3}{16}$ "). Thus, when one cap of a given pair has been exploded, shaft 23 must be rotated four times in order to bring the other cap of the same pair beneath its hammer; and then four more rotations of shaft 23 will bring the first cap of the next pair to position beneath its hammer, and so on. In this way, the caps will be fired at equal intervals. It is to be understood, of course, that the strip is moved when both hammers are in elevated position, and the caps are always fired only while the strip is in still position.

As will be observed, the strip 8 as it is advanced through the firing chamber 1, is adapted to rest upon a part of the frame structure which affords a table or support for the same as indicated by reference numeral 6^a, this table or support being provided with an opening to permit the extension of the teeth of the sprocket 12 to extend up therethrough, as clearly indicated in Figs. 2 and 9. Also, the table or support 6^a serves as an anvil against which the hammers strike during the firing operation.

Upon the shaft 13 there is also freely mount-

ed the star wheel 14 which is adapted to be engaged by the clutch 15 for affording fixed connection of the star wheel 14 with the shaft 13. This clutch member 15 has pins which engage in openings through the star wheel 14, as will be readily understood. The clutch member 15 has spline connection with the shaft 13 and is adapted to be adjusted therealong by means of the yoke lever 16 which is pivotally connected at the point 17 in the frame structure and through the other end of which there extends the rod 18. The one end of the rod 18 has an abutment for the coil spring 19, the other end of which abuts the end portion of the lever 16. The other end of the rod 18 is pivotally connected at the point 20' to the upper end of the trigger 20 which is pivotally mounted at the point 21 in a depending portion of the frame structure. The trigger 20 is adapted to be extended through an opening in the bottom wall of the firing chamber 1 as the unitary combination of feeding and firing mechanism is inserted into position within the firing chamber.

Thus, with the clutch connection just explained, the trigger 20 may be manipulated so as to release the star wheel 14 and thereby maintain the sprocket 12 against rotation temporarily so as to facilitate insertion of the forward end of the cap strip 8 into proper position and thereby insure proper location of the caps themselves immediately beneath the hammers. When the cap strip has thus been properly positioned, the clutch 15 will again be permitted to engage the star wheel 14 so as to then permit the sprocket 12 to be rotated for the normal feeding operation of the cap strip through the firing chamber.

The star wheel 14 is operated by the tooth member 22 which is fixedly mounted upon the upper shaft 23 suitably mounted for rotation within the frame structure. The shaft 23 is the main operating shaft of the mechanism and is connected at its forward end with the pump 4 for operating the main shaft 23, as will be later explained.

The main shaft 23 also has mounted thereupon the grooved wheel 25 which is disposed immediately above the sprocket 12 so as to assist in guiding the cap strip 8 through the firing chamber and in maintaining the perforations 8^a in engagement with the teeth of the sprocket 12 during such feeding operation.

The hammers 26 are pivotally mounted at their rear ends at the points 27 to the posts 28 supported on the table 6^a of the frame structure. These hammers are normally forced downwardly by means of the coil springs 29 which are connected at their upper ends to the lever arms of the hammers and are anchored at the lower ends to suitably provided projections extending inwardly from the side walls of the frame structure 6. The springs 29 extend through openings in the top part 6^a of the frame structure.

As above stated, the hammers 26 are positioned upon opposite sides of the sprocket 12 and are spaced along the path of the strip 8 a suitable distance with respect to the spacing of the caps; and the strip-feeding and cap-firing mechanisms are so constructed and operated that the caps will be fired at equal intervals, as above explained.

The means for raising the hammers comprises the cam members 30 which are fixedly mounted upon the main shaft 23. These cams engage the inwardly extending arms 31 provided upon the lever arms of the hammers 26. The arms

31 are provided with pivotally connected upwardly projecting guide members 32 which extend up through the companion guide members 33 which are supported upon the main frame structure. This guide arrangement is for the purpose of maintaining the parts in proper alignment. Also, the upwardly extending projections 32 are adapted to engage the members 34 which are pivotally mounted in the one end of an opening 35 in the top of the firing chamber 1 and through which openings these members 34 are adapted to extend as an indication of the raised condition of the hammers corresponding thereto.

It will be observed that the two hammers are pivotally mounted at points toward the front and rear, respectively, of the main frame structure and that with this arrangement, there is afforded a comparatively compact arrangement of the mechanism for operating the hammers while at the same time there is afforded also the proper positioning of the hammers with respect to the caps upon the cap strip.

Immediately above that portion of the cap strip which is positioned upon the table 6^a, I have provided the protecting screen 36 which is suitably supported upon the side members 37 and which is cut away so as to permit operation of the hammers. The purpose of the screen 36 is to prevent sparks, as the caps are fired, from flying through the firing chamber and out through the openings in the sides thereof.

The spiral rack 24 is adapted to extend through a suitably formed opening in the ratchet member 38 which is mounted within the rear end portion of the rack 4. Pivotally mounted upon the opposite sides of the pump 4 are the pawls 39 which engage the teeth of the ratchet 38 so as to permit idle turning of the ratchet wheel 38 in one direction. The pawls 39 are maintained in such position by means of the spring 40, which, however, permits turning of the ratchet 38 idly in the one direction, as will be later understood. These parts are so constructed and arranged that the pump 4 which is reciprocatably mounted upon the rod 41, may be moved outwardly toward the front end of the gun as is permitted by the idle turning of the ratchet 38 in a clockwise direction, according to Fig. 3. When, however, the pump 4 is moved rearwardly, there is positive engagement between the pawls 39 and ratchet 38, and there is thereby caused rotation of the spiral rack 24 which in turn causes rotation of the main shaft 23 for operation of the cap-feeding and cap-firing mechanisms.

The rod 41 is mounted upon the under side of the barrels 2 and midway thereof and has its rear end projection freely mounted so as to receive the correspondingly formed guide-opening 42 at the front end of the pump member 4. The coil spring 43 surrounds the rod 41 and is anchored at its forward end at the point 43 to the pump 4. The spring 43 extends the full length of the rod 41 and has an abutment at its rear end against the forward end of the projection 44 which is recessed so as to receive and afford a bearing for the rear end of the rod 41 when the parts are assembled. Thus, upon engaging the finger portion 4^a of the pump with the finger and forcing the pump rearwardly, the spring 43 will be placed under tension which will be sufficient to force the pump forwardly to fully distended position upon release of the same,

whereupon the pump may then again be forced to the rear and this operation continued as long and at as rapid a rate as desired.

Fixedly mounted upon the main operating shaft 23 near the rear end thereof is the weighted fly wheel 45 by which there is produced a certain degree of momentum which can be utilized for the purpose of increasing the rapidity of the succession of percussions.

Affixed to the fly wheel is a fan member 46 which is so constructed and arranged as to propel the smoke from the fired caps forwardly toward the front end of the gun and in this way the smoke for the most part will be emitted from the front end of the barrel and will thus simulate the appearance of a real gun.

At a point just to the rear of the trigger guard 20^a, there is provided the hand grip 47 by which the gun may be held against the shoulder of the user. That is, the gun will be thus held in position by the one hand while the other hand alone may be employed for manipulating the pump 4 back and forth so as to thereby operate the cap-feeding and cap-firing mechanisms.

Thus, I have produced a toy gun in which there may be employed a continuous strip of caps which are adapted to be fired in rapid succession and all of which mechanism is operated by means of the one hand. Not only have I produced a pump gun capable of such manner of operation, but by virtue of the momentum made possible by the fly wheel, the rapidity of the firing can be increased to a very great degree.

Furthermore, the cap strip is fed through the firing chamber in a decidedly positive manner so that there is insured a proper positioning of the caps themselves beneath the hammers. The means by which the cap strip may be initially inserted and positioned within the firing chamber constitutes another prominent feature of this invention.

By virtue of the spiral-rack-operating mechanism, the reciprocatory movement of the pump is converted into a rotative movement for the fly wheel and the cap-feeding and cap-firing mechanisms.

Also, the comparatively compact arrangement of the parts of the mechanism and the manner in which the cap-feeding and cap-firing mechanisms may be assembled or disassembled as a unit, constitutes another advantage of importance in the manufacture of this device, as well as in the cleaning and oiling of the same.

It is to be understood that the present disclosure is merely for purposes of illustration and that other variations and modifications may be made without departing from the spirit of the present invention as herein set forth and claimed.

What I claim is:

In a toy cap gun, the combination of a barrel, a firing chamber, a sprocket for feeding a perforated cap strip transversely through said chamber, hammer means for firing the caps within the chamber, cam and spring means for actuating said hammer, star-wheel mechanism for actuating said sprocket, and a single pump-operated means including a spiral rack and fly-wheel and a one-way connection therebetween, for operating said cam and spring means and said star-wheel mechanism, so as to feed and fire the caps in rapid succession.

HARRY G. CATHCART.