TOY GUN WITH SLIDABLE CHAMBER

Fig. 1.

Fig. 2.

Fig. 3.

Fig. 4.

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This invention relates to toys and more particularly to a toy gun having a safety trigger, the principal object of the invention being to provide a toy of this kind that will prevent the escaping of gases and sparks developed at the moment of the explosion through the bore or priming hole of the gun, by means of a safety device thus protecting the improvised gunner. To this end the said safety device comprises a powder chamber slideably against resilient means housed inside the gun body which, upon engagement with the breech may cause the recoil thereof; the safety device consisting in that the priming hole is formed by two lengths drilled through the barrel and said slideable chamber which prevents escape of flash or sparks developed at the said vent with some danger to the gunner.

The device according to the invention is ideally suited to avoid the said difficulties, solving the problem by means of a slideable chamber which prevents the escape of gases and sparks by interrupting the length of the vent and sealing off the orifice. As already pointed out above the recoil of the chamber makes the model more realistic by assimilating its operation to that of real guns. One important particular, bearing in mind the user's safety, is that the length of the barrel has been exactly calculated so as to hold the explosive charge and the plug blocking the mouth of the gun, provided exclusively in order to increase the volume of the report; this plug or projectile, which may be made of soft, solid or hollow plastic (polyethylene) serves as a shell that can be fired over a distance of from 2 to 3 meters with sufficient aim to hit small targets at these distances or even longer ones. Should the user try to insert a metal projectile or the like, the lack of space for the plug would not allow a perfect seal so that they could escape through the gap about the barrel or ball and by losing itself in the ambient air would not allow the ball to gather sufficient speed or momentum to become an offensive weapon. So that the invention may be clearly understood and practiced in its basic idea, a detailed description of a preferred embodiment of the same will now be given, in which embodiment the barrel has been made according to an old miniaturized model, with reference to the accompanying drawings which form a part of this specification, it being understood that the description and the showings are merely illustrative and are not to be construed as limiting the invention. In the drawings:

FIG. 1 is a sectional view of a gun with an old artillery piece, with the chamber slide against the safety return spring and held in firing position by means of a solid fuse, the gun being duly charged and its mouth plugged by means of a plug inserted with some pressure.

FIG. 2 is similar to FIG. 1, but showing the precise moment when the outer portion of the flash-hole or vent of the gun has been stopped off by the displacement of the safety chamber by the combustion and explosion of the portion of the fuse inside the chamber. This sequence takes place in extremely short fractions of a second, hardly noticeable.

FIG. 3 shows a modified embodiment in which the chamber is pushed towards the breech by resilient means causing the recoil of the gun.

FIG. 4 is a perspective view of the gun to be described, made according to a primitive old model.

Throughout the drawings the same consecutive numbers and letters indicate like or corresponding members or parts.

Essentially and in the particular instance shown in FIG. 1 the present invention comprises an artillery piece made up by a breech 1 from whose high portion there extends the curved surface 2 terminating in the knob 3. The breech is completely closed and the body of the gun is drilled on one side only, constituting the barrel 4. The end of the barrel is shaped according to an old model with a curved profile that strengthened the mouth of the real gun and that used to wear the front sight or aiming point, the other sight being provided on the aforementioned high portion of the breech. The rear part of the gun houses an expansion spring 5 pushing towards the mouth of the gun an insertable slideable chamber 6 and in order to keep this chamber from rotating it may be provided with various devices for annulling this tendency. One of such devices is constituted by a screw 7 engaged in a guideway 8 cut in the barrel, such as shown in FIG. 1, or a guideway 8' in the slideable chamber 6 when the screw 7' is screwed into the barrel, as shown in FIG. 3. This arrangement serves to move completely the two portions or lengths 9 and 10 which make up the drill hole or vent, thus stopping up completely the vent; however when the chamber slides axially its portion of the vent will register with the portion of the vent in the barrel.

In order to insert the fuse the end of the chamber projecting from the mouth of the gun must be pressed, overcoming the tension of spring 5 until the portions 9 and 10 forming the uninterrupted vent register whereupon the fuse 11 may be inserted. In order to keep the safety device described assembled the fuse must have some strength or solidity enabling it to resist the tension of spring 5. As will be seen in the drawings the chamber 6 slides inside the bore of the gun. The plug 12 is inserted in the chamber with some pressure, or an explosive charge not shown in the drawings may be inserted in the said chamber the latter being then stopped up by the said plug in order to enhance the sound effect of the expansive wave. FIG. 2 illustrates the exact moment when the fuse, consumed up to the vent, permits the sliding movement of the chamber that stops up the vent and seals the chamber so that the rest of the fuse within the chamber causes the explosion.

The whole of the outer body of the gun remains stationary.

In a modified embodiment of the invention shown in FIG. 3 the last portion of the breech comprises a sleeve 13 slideable in the hollow interior of a first body 14. This sleeve 13 is secured to a rod 15 which terminates in the
3,151,411 3. chamber 16 after passing through an apertured partition 17. This partition separates inwardly the first body 14 from the barrel 18. Resilient means shown as a spiral expansion spring 19 around rod 15 and are enclosed in the first body 14. This spring pushes the sleeve 13 outwards, bearing against the partition and the partition 17. Consequently the two portions 9 and 10 of the vent are out of registry and in order to insert the fuse it is necessary to push the knob 3' overcoming the tension of the spring 19 until the curved surface 2' abuts the high portion of the breech 1. Thus the two portions 9 and 10 register forming an uninterrupted vent into which the fuse may be inserted. In a further modification the chamber is integral with the barrel and the whole is slidable in the front part of the first body.

In these embodiments, in order to avoid the rotation of the chamber in the barrel, besides the already mentioned devices the same results may be obtained by providing a screw or small stop on the movable member, either the insertable chamber or the barrel, while the guideway is provided in the inner wall of the barrel. This arrangement has the advantage of not being visible from the outside, improving the finishing. Another modification is to make the knob 3 rotate, for which it passes through the partition 17 in a certain shape forcing these members to lie in a determined position, e.g. a straight length or a polygonal shape, e.g. a square one.

The toy is completed by placing the gun on its carriage mount 29 by means of its traverses 21 secured in clamps 22 which permit the gun to be inclined in various angles to take aim. The carriage mount on two wheels 23 has at its sides the usual fittings for this kind of artillery. In FIG. 4 a receptacle 24 and a ramrod 25 are shown.

In another possible modification the trigger device is applied directly to the barrel and this modified embodiment is characterized in that the vent is provided directly in a reduced diameter portion of the rear part of the barrel and is stopped up when upon the burning of the solid fuse the said reduced diameter portion hides inside the gun body when the barrel is being pushed by the tension of the spring. In this embodiment the barrel recoils when the discharge takes place, thus stopping up the vent. This embodiment may be simplified dividing in two the first body and making in the breech portion a housing into which a cylindrical projection of reduced diameter, formed in the front part of the gun, is inserted with a slight play permitting its easy sliding movement. This cylindrical projection contains the vent designed to receive the solid fuse. The curved surface (2 or 2') continues inside the breech in the form of a threaded bolt and passes through a cavity permitting as above the accommodation of an expansion spring, and is then screwed into the said cylindrical projection. When the explosion has taken place the cylindrical projection hides in the housing provided in the breech thus stopping up the vent and causing a tight seal.

The basic mechanism of the invention may be applied to embodiments other than the mentioned ones, comprising amongst others the most recent breech-loading guns. This type of gun has an opening through which the shell and the explosive charge may be introduced and the breechblock and safety device with its corresponding vent, which operates sideways to the bore of the gun and is accessible from the outside by means of a handle which moves along a groove. In order to load the gun this handle is moved sideways and drives against an expansion spring a plunger plugging the opening; the charge is introduced, the plunger is permitted to move until the vent is opposed the loading opening and then the solid fuse is inserted, thus locking the plunger. When fuse is sufficiently burnt down the plunger continues moving and stops up the vent and immediately afterwards the explosion take place.

In an interesting modified embodiment the safety trigger mechanism may be hingedly mounted on a support so as to discharge like a mortar in various angles up to and including a vertical line. Thus the device may be used to launch rockets, gliders and aeroplanes. In one such embodiment used to launch a rocket the latter is provided with a fuse to fire its own propulsive charge. This device gives the missile an initial acceleration and the very flame of the explosion lights the rocket's fuse which previously has been connected to the explosive charge contained in the device. Thus the initial speed impressed on the rocket increases the height of its self-propelled flight.

From the foregoing description and the accompanying drawings it will be clearly seen that this invention as applied to toys and generally to models made to scale provides novel features, particularly by the realistic effect of the discharge which causes the usual recoil in this kind of place of ordnance as well as a loud report, while at the same time the users are protected by the safety members which make up the assembly. The arrangement of the vent in two relatively slidable portions produces a valve effect that stops up the flash-hole preventing the escape of gases and spurs the bolt by which it passes through the partition 17 in a certain shape forcing these members to lie in a determined position, e.g. a straight length or a polygonal shape, e.g. a square one.

The fuse used is compounded according to the following formula:

<table>
<thead>
<tr>
<th>Component</th>
<th>Percent, approx.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Potassium chlorate</td>
<td>40</td>
</tr>
<tr>
<td>Smokeless powder</td>
<td>35</td>
</tr>
<tr>
<td>Carbon black</td>
<td></td>
</tr>
<tr>
<td>Antimony sulphide</td>
<td>5</td>
</tr>
<tr>
<td>Red potassium ferrocyanide</td>
<td>5</td>
</tr>
</tbody>
</table>

Obviously the proportions of the components may vary and what is desired is to obtain a fuse sufficiency solid to lock the mechanism of the gun. The fuse is made by mixing the finely divided components in acetone until a paste mass is formed which is extended into fuse strips. Naturally, when performing this invention certain alterations, modifications and changes may be made in some structural details and in the arrangement and shape of the gun described without departing from the basic principles and the scope of the invention as clearly specified in the following claims.

Having now particularly described and ascertained my said invention and in whatever manner the same is to be performed, I declare that what I claim is:

1. A toy gun comprising, in combination, a gun body member and a chamber member disposed within said body member and each having a small aperture therein for receiving a fuse, said body and chamber members being movable relative to one another between a first relative position wherein said apertures are in alignment and a second relative position wherein said apertures are out of alignment, spring means for urging said members toward said second relative position, said members being manually movable to said first relative position, and a solid fuse adapted to be inserted into the two aligned apertures when said body and chamber members are in said first relative position so as to extend from the exterior of said body member to the interior of said chamber member and thereby hold said members in said first relative position against said spring force whereby upon burning of said fuse said members will be moved by said spring to said second relative position and the burning of the fuse portion within said chamber will produce a report.

2. A toy gun comprising, in combination, a gun body member and an open-ended chamber member disposed within said body member and each having a small aperture therein for receiving a fuse, said body and chamber
members being movable relative to one another between a first relative position wherein said apertures are in alignment and a second relative position wherein said apertures are out of alignment, spring means for urging said members toward said second relative position, said members being manually movable to said first relative position, a plug adapted to be inserted into said chamber to close the open end thereof, and a solid fuse adapted to be inserted into the two aligned apertures when said body and chamber members are in said first relative position so as to extend from the exterior of said body member to the interior of said chamber member and thereby hold said members in said first relative position against said spring force whereby upon burning of said fuse said members will be moved by said spring to said second relative position and the burning of the fuse portion within said chamber will produce a report.

3. A toy gun comprising, in combination, a gun body having a longitudinal axis, a chamber member disposed within said body member, said body and chamber members being movable relative to one another in a direction parallel to said longitudinal axis between a first relative position wherein said apertures are out of alignment, spring means for urging said members toward said second relative position wherein said apertures are out of alignment, alignment means for aligning said apertures, and a solid fuse adapted to be inserted into the two aligned apertures when said body and chamber members are in said first relative position so as to extend from the exterior of said body member to the interior of said chamber member and thereby hold said members in said first relative position against said spring force whereby upon burning of said fuse said members will be moved axially by said spring to said second relative position and the burning of the fuse portion within said chamber will produce a report.

4. The invention of claim 3 wherein guide means is provided to prevent rotation of said body and chamber members when they are moved axially relative to one another.

5. A toy gun comprising, in combination, a gun body member, a chamber member disposed within said body, said body and chamber members each having a small aperture therein for receiving a fuse, said chamber member being movable relative to said first position wherein said apertures are in alignment and a second position wherein said apertures are out of alignment, spring means for urging said chamber member to said first position, and a solid fuse adapted to be inserted into the two aligned apertures when said chamber member is in said first position so as to extend from the exterior of said body member to the interior of said chamber member and thereby hold said chamber member in said first position against said spring force whereby upon burning of said fuse said chamber member will be moved by said spring to said second position and the burning of the fuse portion within said chamber will produce a report.

6. A toy gun comprising, in combination, a gun body having a longitudinal axis, a chamber member disposed within said body, said body and chamber members each having a small aperture generally transverse to said axis for receiving a fuse, said chamber member being axially slideable within said body member between a first position wherein said apertures are in alignment and a second position wherein said apertures are out of alignment, alignment means for aligning said apertures, and a solid fuse adapted to be inserted into the two aligned apertures when said chamber member is in said first position so as to extend from the exterior of said body member to the interior of said chamber member and thereby hold said chamber member in said first position against said spring force whereby upon burning of said fuse said chamber member will be moved by said spring to said second position and the burning of the fuse portion within said chamber will produce a report.

7. A toy gun comprising, in combination, a gun body having a longitudinal axis, a chamber member at its forward end and disposed within said body, said body and chamber member each having a small aperture generally transverse to said axis for receiving a fuse, said chamber member being axially slideable within said body member between a first position wherein said apertures are in alignment and a second position wherein said apertures are out of alignment, alignment means for aligning said apertures, and a solid fuse adapted to be inserted into the two aligned apertures when said chamber member is in said first position so as to extend from the exterior of said body member to the interior of said chamber member and thereby hold said chamber member in said first position against said spring force whereby upon burning of said fuse said chamber member will be moved by said spring to said second position and the burning of the fuse portion within said chamber will produce a report.

8. The invention of claim 7 wherein guide means is provided to prevent rotation of said chamber member within said body member and also to limit the axial movement of said chamber member within said body member.

9. A toy gun comprising, in combination, a generally cylindrical gun barrel member having an axial bore therefor, a generally tubular chamber member closed at its rear end and open at its forward end and disposed within said bore, said barrel and chamber members each having a small aperture generally transverse to the axis of said bore for receiving a fuse, said chamber member being axially slideable within said barrel between a first position wherein said apertures are in alignment and a second position wherein said apertures are out of alignment, alignment means for aligning said apertures, spring means for urging said chamber member to said first position, and a solid fuse adapted to be inserted into the two aligned apertures when said chamber member is in said first position so as to extend from the exterior of said barrel member to the interior of said chamber member and thereby hold said chamber member in said first position against said spring force whereby upon burning of said fuse said chamber member will be moved by said spring to said second position and the burning of the fuse portion within said barrel will produce a report and cause said plug to be propelled from the forward end of said chamber.

10. A toy gun comprising, in combination, a generally cylindrical gun barrel member having an axial bore therefor, a generally tubular chamber member closed at its rear end and open at its forward end and disposed within said bore, said barrel and chamber members each having a small aperture generally transverse to the axis of said bore for receiving a fuse, said chamber member being axially slideable within said barrel between a first position wherein said apertures are in alignment and the open forward end of said chamber is approximately flush with the end of said barrel and a second forward position wherein said apertures are out of alignment and the forward end of said chamber projects forwardly from
the end of said barrel, guide means for preventing rotation of said chamber within said barrel, spring means disposed within said barrel rearwardly of said chamber for urging said chamber toward said second forward position, said chamber member being manually slidably axially to said first rearward position, a plug adapted to be inserted into the forward end of said chamber to close the open end thereof, and a solid fuse adapted to be inserted into the two aligned apertures when said chamber member is in said first rearward position so as to extend from the exterior of said barrel member to the interior of said chamber member and thereby hold said chamber member in said first rearward axial position against said spring force whereby upon burning of said fuse said chamber member will be moved by said spring to said second forward axial position and the burning of the fuse portion within said chamber will produce a report and cause said plug to be propelled from the forward end of said chamber. 

No references cited.