Nov. 28, 1933. A. F. GAIDOS 1,936,905

REFILLABLE SHELL FOR FIREARMS

Original Filed Oct. 12, 1931

FIG. 1.

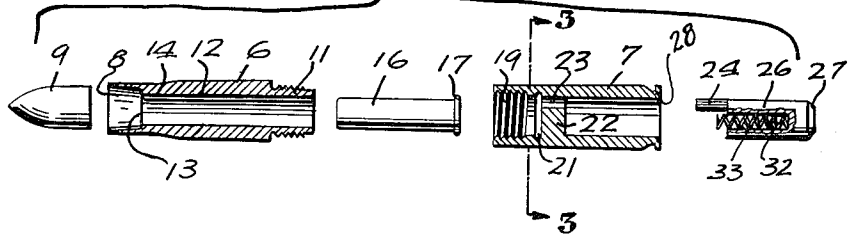


FIG. 2.

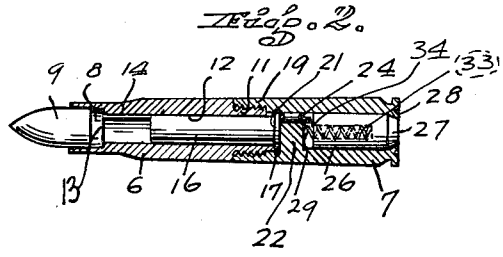


FIG. 3.

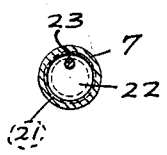


FIG. 4.

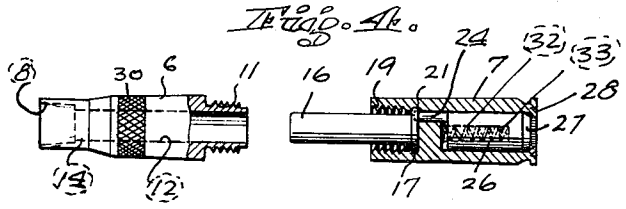
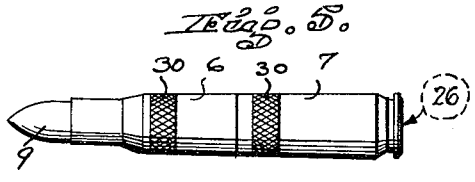


FIG. 5.



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REFILLABLE SHELL FOR FIREARMS

Alonzo F. Gaidos, Redwood City, Calif.

Application October 12, 1931, Serial No. 568,292
Renewed January 4, 1933

17 Claims. (Cl. 102—14)

This invention relates to practice shells for use in firearms, and particularly to refillable practice shells of the type described in my copending application for practice cartridge, filed December 22, 1930, Serial No. 503,957.

An object of my invention is to provide a practice shell in which the propelling charges in various weights are prepared in the form of blank cartridges of varying lengths, fitting in the refillable shell so as to be held in spaced relation behind a suitable bullet to provide an expansion chamber for the complete combustion of the gas evolved from the burning of the powder charge, thus allowing the efficient and accurate varying at will of the range and velocity of the bullet fired from any firearm the shell fits.

Another object of the invention is the provision of a practice shell which is readily reloaded by separating longitudinal sections of the shell, one of the sections being adapted to seal the firing end of the shell by utilizing the expansion of the cartridge rim, and also to engage the said rim to extract the fired cartridge from the other shell when the sections are separated for reloading.

Other objects and advantages are to provide a refillable shell for firearms that will be superior in point of simplicity, inexpensiveness of construction, positiveness of operation, and facility and convenience in use and general efficiency.

In this specification and the annexed drawing, the invention is illustrated in the form considered to be the best, but it is to be understood that the invention is not limited to such form, because it may be embodied in other forms; and it is also to be understood that in and by the claims following the description, it is desired to cover the invention in whatsoever form it may be embodied.

The invention is clearly illustrated in the accompanying drawing wherein,

Fig. 1 is a sectional view of the components, a complete round of ammunition in position for assembly.

Fig. 2 is a sectional view of an assembled and loaded round of ammunition.

Fig. 3 is a cross sectional view of the shell section at the firing end of the shell, the section being taken on the line 3—3 of Fig. 1.

Fig. 4 is a sectional view of a shell after it is fired, the sections being shown in the relative positions immediately after separation.

Fig. 5 is a side elevational view of an assembled, loaded round of ammunition.

While the herein embodiment shows a round of ammunition for use in connection with rim fire cartridges, in a center fire firearm, it is to be understood that the same may be readily constructed with minor variations for center fire cartridges as well as for rim fire cartridges.

In carrying out my invention, I make use of a shell made of two longitudinal sections 6 and 7. The discharge end of the section 6 is recessed at 8 and has a projectile such as the bullet 9, pressed therein. On the other end of the section 6 is a reduced externally threaded male portion 11. A longitudinal recess 12 extends from the outer end of the male portion 11 inwardly to a shoulder 13 of the recess 8. The recesses 8 and 12 are communicated with each other by a free passage forming an expansion chamber 14 between the rear end of the bullet 9 and the inner end of a blank cartridge 16 in the recess 12. The blank cartridge 16 may be made of various lengths, to contain various charges as desired. The rim 17 of the blank cartridge 16 is of larger outer diameter than the body of the cartridge 16 and abuts against the outer end of the said male portion 11. It is to be noted that the outer diameter of the rim 17 is not greater than the diameter of the said male portion 11.

The other section 7 has an internally threaded female end 19 to engage the male portion 11 of the other shell section 6. The outer diameters of the sections 6 and 7 are the same so that the assembled unit forms a continuous shell of the usual shape. At the inner end of the female threads 19 is formed an annular recess or notch 21, which surrounds the outer periphery of the cartridge rim 17 when the ammunition is assembled. Adjacent to the notch 21 is a transverse partition 22 in the section 7, which has an aperture 23 therethrough to accommodate the reduced end 24 of a firing pin 26 therein. The herein illustration shows the firing pin for rim fire cartridges in a center fire firearm, therefore the aperture 23 is eccentric relatively to the section 7 and the reduced pin end 24 is correspondingly eccentric relatively to the firing pin 26. The outer or firing end of the firing pin 26 is beveled at 27 and is held in place by spreading the corners 28 of the firing end of the section 7 over the bevel 27 so as to allow limited longitudinal play of the firing pin 26 in the section 7. This longitudinal movement is allowed by reason of the clearance 29 in front of the pin 26.

A complete round of ammunition is formed by the aforementioned components assembled in the manner described in the following. First the bullet 9 is placed into the recess 8 of the section 6, in the manner described in my aforementioned copending application. Then the blank cartridge 16

is inserted in the recess 12 of the section 6. The blank cartridge is selected according to the propelling charge required. If the shooter wishes to practice in the basement, for instance, at twenty-five yards, then a short blank cartridge is used, and for practice at greater distances correspondingly longer cartridges are used.

Then the female end 19 is screwed onto the male end 11 so that the sections 6 and 7 are detachably united and the cartridge 16 is firmly held in place. Thus a complete round of ammunition can be formed by reloading in a very short time.

In operation, the round of ammunition is placed in the firearm, in the usual manner. The firing end of the shell section 7 is thus held in operative relation to the usual firing mechanism of the firearm. The firing mechanism of the arm strikes the auxiliary pin 26 causing the latter to strike the primer rim 17 of the cartridge 16, which ignites the charge in the blank cartridge 16. The gases from the burning charge expand in the chamber 14 and exert a pressure on the base of the bullet 9, to expel the same. Upon firing the rim 17 of the cartridge expands against the partition 22 and into the annular recess or notch 21, thereby positively sealing the aperture 23. The notch 21 holds the rim 17 so that when the sections 6 and 7 are unscrewed and detached from each other, the section 7 extracts the fired blank cartridge 16 from the section 6. Inasmuch as the metal of the blank cartridge is comparatively pliant, it can be readily pulled out of the section 7, the force of the manual pull deforming the rim 17 sufficiently to allow its withdrawal from the notch 23. Then a new bullet and cartridge can be inserted in the section 6, and the components assembled in the aforesaid manner to form a reloaded round of ammunition. In order to facilitate the handling of the sections, a portion of the outer periphery of each section is knurled as at 31.

While the firing pin 26 can be readily dropped back toward the firing end of the section 7 by slightly shaking the shell, yet it is desirable, as a measure of safety, to render the retraction of the reduced pin end 24 and of the pin 26 automatic. A recess 32 is provided in the end of the pin 26 adjacent the partition 22, in which recess is disposed a coil spring 33 bearing against the bottom of the recess 32 at one end thereof and against the transverse section 22 at the other end. The spring 33 being of the compression type urges the firing pin 26 rearwardly and away from the cartridge 16, thereby drawing back the reduced pin end 24 therewith, and permitting the ready assembly of the shell. When the firing mechanism of a firearm strikes the pin 26, the latter is moved against the action of the spring 32 toward the partition 22 as heretofore set forth.

In some instances the discharge end of the shell section 6 expands slightly and in order to prevent looseness of the end of the bullet 9 therein at any time, the recess 8 is provided with a rearwardly tapered, conical inner wall of such incline as to permit the pressing of the bullet thereinto without engaging the shoulder 13. The more the recess 8 is expanded, the farther the bullet 9 extends into the recess 8. Then by slightly compressing the said discharge end, the recess 8 is again returned to its original shape. Thus a comparatively large number of bullets 9 may be projected from the shell without any looseness or play or the necessity of readjustment of the discharge end of the shell section 6, and proper compensation is made for the usual deformation of the recess 8 of this type.

Having thus described this invention, what I claim and desire to secure by Letters Patent is:

1. The combination with a shell made of detachably united longitudinal sections and having a bullet fastened in the section at the discharge end of the shell, a cartridge in the other shell, and a firing mechanism, of means in the second section of the shell to grip the rim of the cartridge when the rim is expanded by the explosion of the charge so as to extract the fired blank cartridge from the first section when the shell sections are detached from each other, and means operatively related to said gripping means to allow the action of the firing mechanism of a firearm upon the cartridge.

2. The combination with a shell made of detachably united longitudinal sections and having a bullet fastened in the section at the discharge end of the shell, a cartridge in the other shell, and a firing mechanism, of a sealing element in the second section adjacent the end of the cartridge being adapted to allow the action of a firing mechanism therethrough, and means adjacent the said element to receive the expanded rim of the cartridge when the cartridge is fired so as to cooperate with said sealing element and prevent the escapement of gases rearwardly from the shell and to retain said rim while the sections are detached from each other.

3. The combination with a shell made of detachably united longitudinal sections and having a bullet fastened in the section at the discharge end of the shell, a cartridge in the other shell, and a firing mechanism, of a partition wall in the second section adjacent the rim end of the cartridge and adapted to allow the action of a firing mechanism therethrough, said section having an annular notch formed therein at said rim to receive the expanded rim after the cartridge is fired to seal the second section against escapement of gases and to retain said rim while the sections are separated.

4. The combination with a shell made of detachably united longitudinal sections and having a bullet fastened in the section at the discharge end of the shell, a cartridge in the other shell, of an auxiliary firing mechanism in the second section being adapted to convey the action of a usual firing mechanism to the cartridge, a partition between the auxiliary firing mechanism and the end of the cartridge adapted to allow the firing action of said auxiliary mechanism therethrough, said second section having an annular recess around the rim of the cartridge into which the rim expands when the cartridge is fired to seal the second section at said partition, and to be retained therein while the shell sections are separated.

5. In a refillable shell, a shell section having a bullet in one end and a cartridge in the other end thereof, so that the rim of the cartridge is outside of the second end of the shell section, a second shell section detachably secured to the second end of the first shell section and adapted to accommodate a firing pin in its other end, and means in the second section against which the rim of the cartridge is expanded as the cartridge is fired to seal the firing end of the second shell.

6. In a refillable shell, a shell section having a bullet in one end and a cartridge in the other end thereof, so that the rim of the cartridge is outside of the second end of the shell section, a

second shell section detachably secured to the second end of the first shell section and adapted to accommodate a firing pin in its other end, means in the second section against which the rim of the cartridge is expanded as the cartridge is fired to seal the firing end of the second shell, and means related to said sealing means to receive and retain the expanded rim of the cartridge when the shell sections are separated.

7. In combination, a shell section having a bullet in one end thereof, and a portion at its other end into which a cartridge fits so that the rim of the cartridge is outside the end of the said portion, another shell section having a portion on an end thereof to be secured over the said first portion on the first section, the other end of said second shell section being adapted to accommodate a firing pin therein; and means in the second section against which the rim of the fired cartridge is expanded to seal the firing end of the second section.

8. In combination, a shell section having a bullet in one end thereof, and a male portion at its other end into which a cartridge fits so that the rim of the cartridge is outside the end of the male portion, another shell section having a female portion on an end thereof to be secured over the said male portion, the other end of said second shell section being adapted to accommodate a firing pin therein; and means in the second section against which the rim of the fired cartridge is expanded to seal the firing end of the second section, said last means being adapted to hold the cartridge rim when the sections are separated so as to extract the cartridge from the first section.

9. The combination with a shell made of detachably united longitudinal sections, to hold a cartridge in operative relation behind a bullet in an end of the shell and in operative relation to a firing mechanism at the other end of the shell, of a perforated partition wall intermediate the ends of one section between the rim of the cartridge and the firing mechanism, to allow the action of the firing mechanism through its perforation, the said partition being so disposed that the rim of a fired cartridge is expanded thereagainst to seal the said perforation.

10. The combination with a shell made of detachably united longitudinal sections, to hold a cartridge in operative relation behind a bullet in an end of the shell and in operative relation to a firing mechanism at the other end of the shell, of a perforated partition wall in one section between the rim of the cartridge and the firing mechanism, to allow the action of the firing mechanism through its perforation, the said partition being so disposed that the rim of a fired cartridge is expanded thereagainst to seal the said perforation, said second section having an annular recess formed therein around the rim of the cartridge to receive and hold the expanded rim periphery so as to extract the rim from the first section, when the shell sections are detached from each other.

11. In a shell made of detachably united longitudinal shell sections, the combination with a section having a bullet in one end and a cartridge in the other end thereof, of a second section detachably secured to the cartridge receiving end of the first section, a transverse partition dividing the second section, a firing pin on the outer side of the partition, said partition being adapted to allow the action of the pin on the rim of the cartridge, said partition being so disposed relatively to the rim of the cartridge when the sections are united as to allow the expansion of the rim of the fired cartridge thereagainst to prevent the escapement of gases toward the firing pin.

12. In a shell made of detachably united longitudinal shell sections, the combination with a section having a bullet in one end and a cartridge in the other end thereof, of a second section detachably secured to the cartridge receiving end of the first section, a transverse partition dividing the second section, a firing pin on the outer side of the partition, said partition being adapted to allow the action of the pin on the rim of the cartridge, said partition being so disposed relatively to the rim of the cartridge when the sections are united as to allow the expansion of the rim of the fired cartridge thereagainst to prevent the escapement of gases toward the firing pin, said second section having an annular recess formed therein around the rim of the cartridge to receive and hold the expanded rim periphery so as to extract the rim from the first section when the shell sections are detached from each other.

13. In a refillable shell of the character described, a pair of longitudinal shell sections, a threaded male end on one section, a complemental threaded female end on the other section, a bullet in the discharge end of the first section, a cartridge in the threaded male end of the first section, the said male end being adapted to hold the rim of the cartridge outside of the said male end; an auxiliary firing pin in the firing end of the second section, a partition in the second section abutting against the rim of the cartridge when the sections are assembled, said partition being perforated to allow the striking of the rim by the pin therethrough, and said second section having an annular recess therein in registry with the periphery of the cartridge rim to receive and hold the rim periphery when the rim is expanded by the firing of the charge in the cartridge.

14. A refillable shell comprising a shell section having a female thread at one end, a discharge shell section having a male thread thereon in engagement with the said female thread, a bullet pressed into the discharge end of the discharge section; a cartridge removably disposed in the discharge section, said discharge section being adapted to hold the cartridge in spaced relation to the base of the bullet; an auxiliary firing pin in the first section extending from the firing end of said section substantially to the said cartridge and being adapted to transmit the stroke of the firing mechanism of the firearm to the said cartridge.

15. A refillable center fire shell for a high pressure firearm comprising a shell section having a female thread at one end, a discharge shell section having a male thread thereon in engagement with the said female thread, a bullet pressed into the discharge end of the discharge section; a rim fire cartridge disposed in the discharge section, said discharge section being adapted to hold the cartridge in spaced relation to the base of the bullet; an auxiliary firing pin in the first section extending from the firing end of said section substantially to the said cartridge and being adapted to convert the center fire action of the firing mechanism of said firearm to rim fire action on the rim of said cartridge to transmit the stroke of the firing mechanism of the firearm to the said cartridge.

16. In combination a shell, tubular sections arranged end to end to form the shell, one of said sections having an enlarged recess formed

in the free end thereof, a projectile in said recess, a shank of reduced diameter formed at the other end of the same section, a cartridge inserted in said shank so that the rim of the cartridge abuts the end of the shank, means to detachably fasten the other section onto said shank, and an auxiliary firing mechanism in the second section arranged to be actuated by the usual firing mechanism of a firearm, and to act on said cartridge.

17. In a refillable shell comprising two detachable sections, of the character described, a projectile in an end of the shell, and a propelling charge in the shell rearwardly of the projectile, said shell having a recess at its discharge end tapered from the end inwardly to receive said projectile.

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