United States Patent [19]

Wells

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[54] **CARTRIDGE MAGAZINE**

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[73] Assignee: **The United States of America as represented by the Secretary of the Army,** Washington, D.C.

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[52] **U.S. Cl.** **42/50**

[51] **Int. Cl.** **F41c 25/02**

[58] **Field of Search** 42/50, 50.1

[56] **References Cited**

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[57] **ABSTRACT**

A cartridge magazine includes a case fabricated from plastic with an insert of metal installed therein to bear the high stresses applied to the magazine and the impact contacts of firearm structures therewith.

10 Claims, 7 Drawing Figures

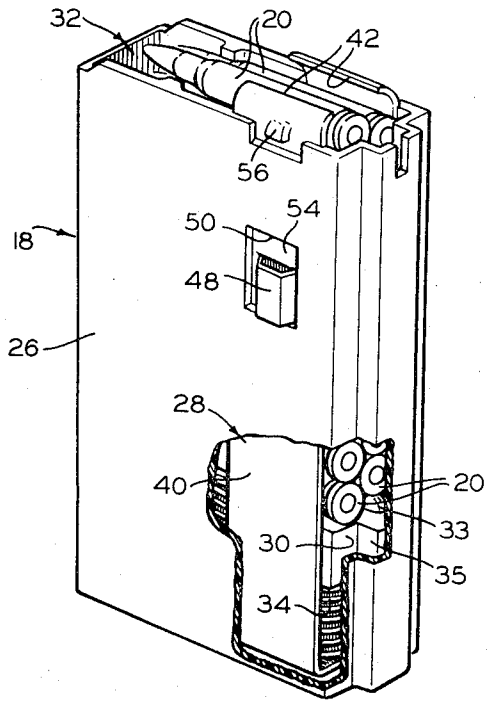


Fig. 1.

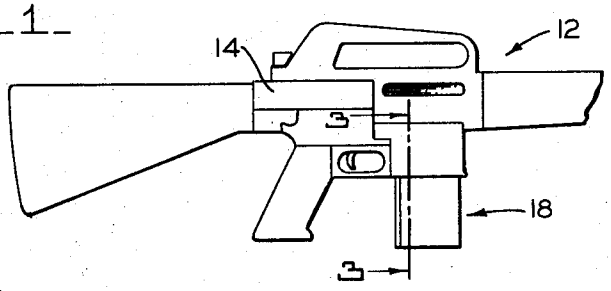


Fig. 2.

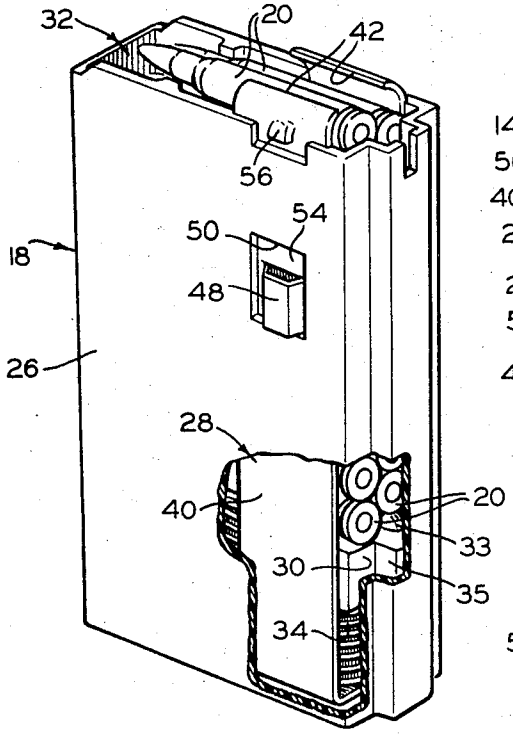


Fig. 3.

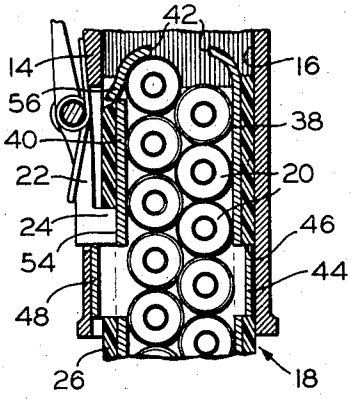


Fig. 4.

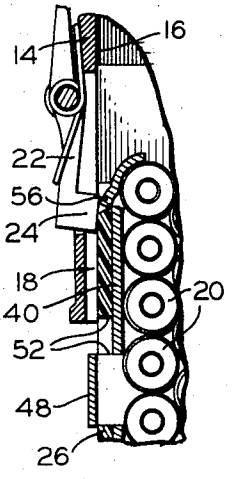


Fig. 5.

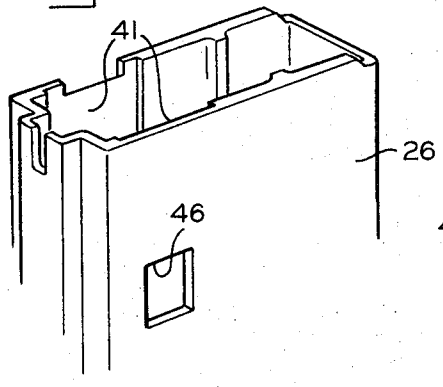


Fig. 6.

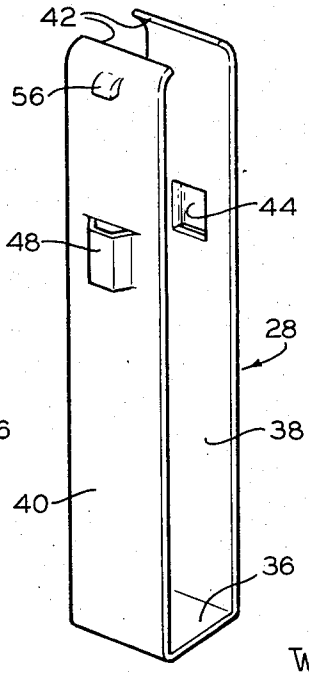
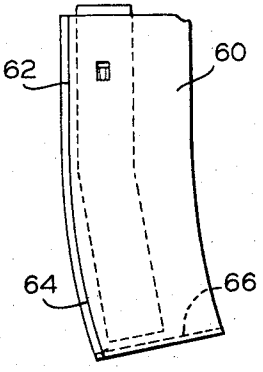


Fig. 7.



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CARTRIDGE MAGAZINE

The invention described herein may be manufactured, used and licensed by or for the Government for governmental purposes without the payment to me of any royalty thereon.

The benefits which are possible with the fabrication of cartridge magazines from plastic material are many because of the relatively light weight of plastic and because the processes for forming the magazines therefrom are both rapid and economical. These benefits have been recognized and efforts made to design and use magazines fabricated from plastic material in the past. These efforts, however, have not proven successful as the magazines have not had sufficient strength at the areas where high stresses and impacts are imposed. Attempts to overcome these problems have led to magazines which are either complex as to the method of fabrication or which involve a number of component parts.

The present invention overcomes these problems by providing a magazine which is easy to manufacture and which is sufficiently inexpensive to be expendable but is durable enough to be reusable many times where salvage of emptied magazines is possible. This is achieved by providing a case, which is easily fabricated by either a molding or an extrusion process from plastic or other inexpensive, easily worked material, with a metallic insert of minimum complexity of design and size, which is formed by a stamping technique and installed in the case where the stresses and impacts are applied to the magazine.

Further objects and advantages of the invention will be apparent from the specification and accompanying drawings which are for the purpose of illustration only and in which:

FIG. 1 is a fragmentary elevational view of a rifle with the magazine of this invention installed therein;

FIG. 2 is an enlarged perspective view of the magazine with one side partially broken away to show the interior thereof;

FIG. 3 is a fragmentary, enlarged cross-sectional view taken along line 3—3 of FIG. 1;

FIG. 4 is a fragmentary view showing the cooperation between the latch and the ear in the insert during installation of the magazine into the rifle;

FIG. 5 is a fragmentary perspective view of the top portion of the magazine case;

FIG. 6 is a perspective view of the insert; and

FIG. 7 is an elevational view of an alternate embodiment of the magazine which is designed to hold a larger load of cartridges.

Shown in the FIGURES is a fragmentary view of a rifle 12 having a receiver 14 with a well 16 for receiving a magazine 18 designed to hold a plurality of cartridges 20 arranged in a double-row and staggered relationship as is well-known in the art and as especially shown in FIG. 3. As shown also in FIG. 3, a latch 22 with a head portion 24 is pivotally mounted on receiver 14 and is spring biased to a latching position for releasably holding magazine 18 in the receiver, as hereinafter described.

Magazine 18 consists of a case 26, an insert 28 and a follower 30 which is slidingly mounted for vertical displacement in the case and is biased towards open end 32 thereof by a follower spring 34. Follower 30 is provided on one side with a longitudinal hump 33 which establishes the staggered relationship of cartridges 20 and a tab 35 extends from the rear end for cooperation in known manner with a bolt stop (not shown). Case 26 is of simple rectangular configuration so as to be easily formed by a molding or an extrusion process. Insert 28 is a stamping from sheet metal and, as especially shown in FIG. 6, is formed to an essentially U-shaped channel configuration with a base 36, a right side 38 and a left side 40. Channels 41, shown particularly in FIG. 5, are formed in the inside wall of each of the sides of case 26, to cooperate in receiving sides 38 and 40 of insert 28 which is held thereby against longitudinal displacement respective to the case. The length of insert 28 is approximately one-half that of the case of cartridges 20, which is sufficient to provide support for the areas of impact and stresses, as noted hereinafter, and channels 41 locate the insert in the rear portion of case 26, as shown in FIGS. 2 and 5.

The free ends of sides 38 and 40 curve inwardly above open end 32 of case 26 to form a pair of lips 42 which alternately hold the top one of the cartridges 20 for longitudinal extraction by the rifle bolt (not shown), as is well-known in the art. Right side 38 is pierced by two vertically spaced longitudinal slits and the metal in between is pressed outwardly to form a rectangular boss 44 which, when insert 28 is correctly located in case 26, projects through a mating hole 46 therein to releasably connect the insert against displacement with respect to the case. Left side 40 is similarly pierced by two vertically spaced longitudinal slits and the material therebetween pressed outwardly to form a protruding stop 48 which is receivable by an opening 50 in the corresponding side of case 26. When insert 28 is secured to case 26 by boss 44 a portion of opening 50 extends above the top of stop 48 to form a pocket 52, backed by portion 54 of left side 40. Pocket 52 receives head portion 24 of latch 22, as shown in FIG. 3, when magazine 18 is correctly located in well 16 for releasably securing the magazine therein.

Formed in left side 40 of insert 28 so as to be located immediately above the top of case 26, as shown in FIG. 2, when magazine 18 is latched to receiver 14, is an ear 56 which inclines outwardly and downwardly so as to cammingly direct head portion 24 onto the outside surface of the face when the magazine is pushed into well 16, as shown in FIG. 4.

Magazine 18 is assembled by introducing sides 38 and 40 of insert 28 into channels 41 through open end 32 and pressing the insert into case 26 until boss 44 contacts the top edge thereof. Spring 34, which consists of a plurality of elongated coils, is then installed in insert 28 between sides 38 and 40. Follower 30 is next installed between sides 38 and 40 above spring 34 and depressed until the coils of the spring are solid, which locates the follower below boss 44 so that sides 38 and 40 may be pressed together sufficiently for the boss to enter case 26. Insert 28 is now free to be pressed downwardly into case 26 until boss 44 snaps into hole 46. With insert 28 in assembled position, the pressure holding follower 30 down is released whereby the follower and spring 34 extend upwardly in insert 28 so that sides 38 and 40 are held rigidly apart by the follower and the coils of the spring and boss 44 is consequently securely held in hole 46. When magazine 18 is loaded with cartridges 20, the bias of spring 34 thereagainst holds sides 38 and 40 apart and boss 44 in hole 46.

Magazine 18 is installed in rifle 12 by inserting the top end into well 16 and pressing the magazine up-

wardly thereinto. When ear **56** contacts head portion **24** of latch **22**, the latch is cammed outwardly and the head portion delivered to the outside of case **26** without contacting the edge thereof so as to prevent any damage thereto. Continued pressure on magazine **18** moves it into well **16** to a position where head portion **24** contacts stop **48** whereupon it snaps into pocket **52** to releasably secure the magazine to receiver **14**.

From the foregoing it is clearly apparent that the high stresses imparted to magazine **18** are born by insert **28**. The pressure applied by spring **34** is born by lips **42**, through the stacks of cartridges **20**, and base **36** and the lips take the impact applied by succeeding ones of the cartridges **20** when the leading one is stripped from magazine **18** by the rifle bolt (not shown). Moreover, ear **56** functions as a protective area for the magazine against impact by head portion **24** of latch **22** during installation of the magazine in well **16**. In addition thereto, head portion **24** comes into contact with stop **48** to stop the insertion of the magazine beyond its correct position in receiver **14**. Also, the spring bias of latch **22** presses head portion **24** thereof against portion **54** of left side **40**, which forms the back of pocket **52**.

It is evident that case **26** can be readily and economically fabricated in one piece as can insert **28**, and the assembling of the units of magazine **18** is easily accomplished. It is also apparent that while the magazine is inexpensive enough to be expendable it is rugged enough to be reused many times.

Shown in FIG. **7** is an alternate embodiment which shows the configuration of the magazine when it is extended to hold a larger load of cartridges **20**. This embodiment includes a case **60** having a straight section **62** essentially the same as case **26** so as to be insertable within well **16**. Extending from straight section **62** is a curved section **64** formed with a single radius.

I claim:

1. In combination with a firearm comprising a receiver with a magazine well, a magazine for cartridges comprising a case with an open top end insertable into the magazine well, an insert of U-shaped channel configuration having a length approximately one-half that of one of the cartridges, a pair of vertical channels formed within said case to matingly receive said insert therebetween when installed through the open end, cooperating means in said insert and case for releasably connecting said insert therein against displacement relative thereto, a follower slidingly disposed within said insert for vertical displacement therein and for cooperation therewith to block disconnection of said means, a spring disposed between said insert and said follower for biasing said follower towards the top end, and said spring comprising a plurality of coils disposed in cooperation with said insert to assist said follower in blocking disconnection of said means.

2. The invention as defined in claim **1** wherein said insert comprises a base for supporting one end of said spring and bearing the stresses thereof when compressed, and a pair of sides respectively received by said pair of channels, and wherein said means includes a boss formed from one of said pair of sides, and said case having a hole for matingly receiving said boss when said insert is correctly positioned in said case.

3. The invention as defined in claim **2** wherein said magazine is designed to hold the cartridges in a double-row staggered relationship and said insert includes a pair of lips respectively formed on the ends of said sides remote from said base to alternately hold the top one of the cartridges in the magazine in position to be stripped therefrom.

4. The invention as defined in claim **2** wherein the firearm includes a pivotal latch with a head spring biased to a latching position respective to the magazine, and said insert includes an ear extending from the opposite one of said sides so as to incline downwardly and outwardly therefrom, said ear being located so as to be contactable by the head of the latch during insertion of the magazine into the magazine well for cammingly directing the head to the exterior of said case without contacting the edge thereof at the top end.

5. The invention as defined in claim **4** wherein said insert includes a stop protruding from said opposite one of said sides and said case is provided with an opening for receiving said stop when said insert is connected to said case, said stop being disposed for contact by the head of the latch to stop insertion of the magazine into the magazine well at the correct position, said opening extending above the head of the latch when said insert is secured by said means to said case to form a pocket above said stop for receiving the head of the latch when the magazine is correctly positioned in the magazine well to releasably hold the magazine therein.

6. The invention as defined in claim **5** wherein said opposite one of said sides includes a section forming the back of said pocket to bear the stresses applied by the bias of the head of the latch when received thereby.

7. The invention as defined in claim **6** wherein said case is formed as a single unit from a plastic material and said insert is formed from a metallic material.

8. The invention as defined in claim **6** wherein said insert is fabricated from sheet metal and said ear, boss, stop and lips are formed therein by a stamping technique.

9. The invention as defined in claim **6** wherein said case includes a rectangular section receivable by the magazine well and a curved section with a single radius extending therefrom.

10. A cartridge magazine of plastic, a follower and follower spring for the magazine, metal insert means lining at least a portion of the magazine as well as forming the usual magazine lips and providing a metal path for the follower spring load, and a metal base support for the spring associated with the insert means.

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