

TITLE

Ammunition Magazine

CROSS-REFERENCES TO RELATED APPLICATIONS

This application claims priority as a perfection of prior filed U.S.

- 5 provisional application number 61/587,604, filed January 17, 2012 and incorporates the same by reference herein in its entirety.

TECHNICAL FIELD

The present invention relates to the field of firearms and more particularly relates to an improved ammunition magazine.

10 BACKGROUND ART

- Ammunition magazines are well known in the art of firearms. Their basic construction is a containment shell with two open ends. One end is deemed the “floor” of the magazine and is covered by a plate while the opposite end is the “feed” end and interfaces with the weapon. Inside the volume defined by
- 15 the shell and plate is a spring and follower assembly. When ammunition is loaded into the magazine, the ammunition pushes the follower down towards the floor and thereby compresses the spring. In use, when one cartridge of ammunition is expended, the compressed spring releases and pushes the follower and associated ammunition upwards toward the feed end and the next
- 20 round of ammunition is thereby readied.

Prior magazines have been manufactured in many different configurations and of different materials. Perhaps the best known in the U.S. are the AK-47 and the USGI AR15/M16 magazines. These magazines function similarly, though they are made with slight variations to interface with their host system.

Of notable difference is that the AK-47 magazine has a relatively constant curvature while the AR15/M16 magazine has a less curved lower region that gradually resolves to a more linear function towards the feed end. Both use the same type of internal system. Of particular note with both systems, and all
5 follower magazine systems, is that the system works well only as the follower smoothly and levelly travels the inside of the magazine. As the follower must move, there is room for the follower in all the known prior art magazines to move axially, or "wobble," and possibly jam. This is notorious in the AR15/M16 magazine style as the geometry of the magazine is inherently not uniform.

10 Previous attempts to address the many issues with the AR15/M16 magazine have been made, including magazines previously invented by the applicants and disclosed in U.S. Pat. Nos. 7,908,780, issued March 22, 2011, and 8,069,601, issued December 6, 2011. Both of these patents and products based upon them have fared well in the market as solutions to AR15/M16
15 magazine issues and serve as a basis for the magazine construction disclosed herein. Accordingly, these two patents are incorporated by reference in their entirety herein.

Of particular interest in the construction of ammunition magazines is the shape of and interface between the follower and the floor plate. The interface
20 needs to be stable when the magazine is fully loaded and, traditionally, the floor plate has been flat with the follower having some contact with the floor plate when the magazine was fully loaded. Various follower designs have been introduced in efforts to improve the performance of ammunition magazines;

however, there is usually some trade-off between the motion of the follower and associated round stack and ultimate stability.

The present invention is a polymer magazine utilizing an improved floor plate and interfacing follower. The follower is constructed with fore and aft legs, the fore leg being longer. The floor plate is generally a two-piece floor plate and lock plate combination, the lock plate becoming a shoe for the follower when the magazine is fully loaded. In an alternate, slim-line, version, the lock plate is omitted and the floor plate serves as the follower's shoe.

DISCLOSURE OF THE INVENTION

10 In view of the foregoing disadvantages inherent in the known types of ammunition magazines, this invention provides an improved magazine. As such, the present invention's general purpose is to provide a new and improved magazine that is backwards compatible with known weapon platforms and presents a more stable follower and follower path.

15 To accomplish these objectives, the improved follower and floor plate combination provides a lock plate serving as a shoe to directly and perfectly fit and support the follower when the magazine is fully loaded. In an alternate embodiment, the floor plate is so constructed to serve the same purpose without the lock plate. The follower, in either event, is constructed in a manner
20 to facilitate travel throughout the length of the magazine body.

The more important features of the invention have thus been outlined in order that the more detailed description that follows may be better understood and in order that the present contribution to the art may better be appreciated.

Additional features of the invention will be described hereinafter and will form the subject matter of the claims that follow.

Many objects of this invention will appear from the following description and appended claims, reference being made to the accompanying drawings
5 forming a part of this specification wherein like reference characters designate corresponding parts in the several views.

Before explaining at least one embodiment of the invention in detail, it is to be understood that the invention is not limited in its application to the details of construction and the arrangements of the components set forth in the
10 following description or illustrated in the drawings. The invention is capable of other embodiments and of being practiced and carried out in various ways. Also it is to be understood that the phraseology and terminology employed herein are for the purpose of description and should not be regarded as limiting.

15 As such, those skilled in the art will appreciate that the conception, upon which this disclosure is based, may readily be utilized as a basis for the designing of other structures, methods and systems for carrying out the several purposes of the present invention. It is important, therefore, that the claims be regarded as including such equivalent constructions insofar as they do not
20 depart from the spirit and scope of the present invention.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is a perspective view of a magazine utilizing an embodiment of the invention.

Figure 2 bottom plan view of the magazine of FIG. 1.

Figure 3 is a top plan view of the magazine of FIG. 1, with its spring compressed.

Figure 4 is sectional view of the magazine of FIG. 3, taken along line A-A.

Figure 5 is a close up view of the magazine of FIG. 4, taken in circle B.

5 Figure 6 is a perspective view of the follower, lock plate and spring of the magazine of FIG. 1.

Figure 7 is a side elevation of the follower, spring and lock plate of FIG. 6.

Figure 8 is a rear elevation of the follower, spring and lock plate of FIG. 6.

10 Figure 9 is a perspective view of a magazine using an alternate embodiment of the invention

Figure 10 is front elevation of the magazine of FIG. 9.

Figure 11 is a rear elevation of the magazine of FIG. 9.

Figure 12 is a top plan view of the magazine of FIG. 9, with its spring compressed.

15 Figure 13 is sectional view of the magazine of FIG. 12, taken along line C-C.

Figure 14 is a close up view of the magazine of FIG. 13, taken in circle D.

Figure 15 is a perspective view of the follower, lock plate and spring of the magazine of FIG. 9.

20 Figure 16 is a side elevation of the follower, spring and lock plate of FIG. 15.

Figure 17 is a rear elevation of the follower, spring and lock plate of FIG. 15.

Figure 18 is a partial lower perspective view of an alternate magazine casing.

Figure 19 is another partial lower perspective view of the magazine casing of FIG. 18.

5 Figure 20 is a sectional view of the casing of FIG. 19.

BEST MODES FOR CARRYING OUT THE INVENTION

With reference now to the drawings, the preferred embodiment of the ammunition magazine is herein described. It should be noted that the articles “a”, “an” and “the”, as used in this specification, include plural referents unless
10 the content clearly dictates otherwise. The following reference numerals are used throughout the drawings to indicate the following features of the invention:

- 1 – Magazine
- 2 – Magazine Casing
- 15 3 – Follower Spring
- 4 – Magazine Spine
- 5 – Paint Matrix
- 6 – Front Magazine Notch
- 7 – Magazine Stop
- 20 8 – Rear Magazine Notch
- 9 – Spine Groove
- 10 – Floor Plate
- 12 – Lock Plate
- 14 – Lock Plate Tab

16 – Lock Plate Cradle

18 – Lock Plate Pillar

20 – Magazine Follower

22 – Follower Front Leg

5 24 – Follower Rear Leg

30 – Alternate Floor Plate

32 – Alternate Cradle

34 – Alternate Pillar

36 – Cradle Tooth

10 38 – Pillar Tooth

With reference to FIG. 1, the magazine 1 generally comprises a generally rectangular casing, having short fore and aft sides and longer lateral sides and an open floor end and an open feed end. Feed lips are provided at the feed end to interface with a weapon and to guide cartridges into the firing chamber of

15 said weapon. The floor end is capped with a floor plate 10. Ideally, floor plate 10 is secured by a lock plate 12 (FIG. 5). The manner in which the lock plate 12 secures the floor plate 10 is as follows: the floor plate 10 is configured to slide over a rim at the floor end of the magazine. The lock plate 12 rests against the floor plate 10 and is under pressure from the follower spring 3. A tab 14 of the

20 lock plate 12 is positioned to pass through an orifice of the floor plate (FIG. 2). As the lock plate 12 is under pressure, the tab maintains its position and prevents the floor plate 10 from sliding off of the magazine's rim.

As shown in FIGS. 4–8, the follower 20 may be constructed with rear leg 24 shorter than the front leg 22. This construction makes the system clear dirt

and grime easier than having the two legs equal in length. To compensate for the shortened leg 24, a pillar 18 is constructed on the lock plate 12 in a manner to abut the shorter rear leg 24 when the spring 3 is compressed. Together, the pillar 18 and shorter rear leg 24 should be about equal to the length of the forward leg 22. Together, these structures will prevent the spring 3 from being over-compressed and provide greater stability to the round stack and system when the spring is compressed to its maximum extent.

Another improvement is the addition of a cradle 16 at the fore end of the lock plate 12. The cradle 16 extends into the magazine body and will interface with the forward leg 22 as the spring 3 is compressed. The cradle 16 serves as a block in the instance where a large amount of force compresses the spring 3 and, in turn, pushes the lock plate 12 and floor plate 10 slightly beyond the lower rim of the magazine 1. Without the cradle 22, such circumstances may cause the lock plate 12 to slip out of alignment with the magazine casing. The cradle 22 also contributes to follower stability at the lower magazine extremity. Together, the pillar 24 and cradle 22 make the lock plate 12 a type of shoe for the spring 3 and follower 20.

Figure 9 depicts a magazine utilizing an alternate embodiment of the invention where the floor plate 30 is a slim-line floor plate and performs functions of both the floor plate 10 and lock plate 12 of the previous embodiment. Modified floor plate 30 engages notches 6 and 8 on the front and back sides of the magazine 1 respectively, shown in FIGS. 10 and 11. Like the previous embodiment, the modified floor plate 30 becomes a shoe for the spring 3 and follower 20, as shown in FIGS. 12-14. Floor plate 30 provides a

pillar 34 for the rear leg 24 of follower 20 and a narrower cradle 32 for the forward leg 22. These structures function generally in the same manner as described above. Of note, both cradle 32 and pillar 34 have teeth 36, 38 which interface with notches 6, 8 in the magazine body, thus securing the floor plate 30 to the magazine 1 (FIGS. 15–17).

Another improvement to the structure of the magazine is illustrated in FIGS. 18–20 where a pair of spines 4 is built into a lower hind area of the magazine. Spines 4 are in essence a continuation of a trench in the rear of the magazine that nests the rear leg 24, as can be seen in FIG. 5. The spines 4 are essentially formed by removing material from the wall of the magazine around the trench, forming two channels 9 on either side of the spines 4 with the trench continuing therebetween. Ideally, the spines 4 and channels 9 may extend as far up the magazine as the point where the exterior geometry straightens so as to be inserted into a magazine well of a firearm, roughly as far as over-insertion stop 7 in FIG. 9. The purpose of this construction is to aid in clearance of debris and grit and to improve processing in general. As the spines 4 are, in essence, a continuation of the trench, the follower is guided by them and, if extended far enough up the magazine, the point where the channels 9 end could be used as an internal follower stop.

20 INDUSTRIAL APPLICABILITY

The present invention has industrial applicability as it may be manufactured in industry. In all of these embodiments, the preferred magazine body is comprised of a glass-reinforced thermoplastic polymer selected to resist the heat generated from firing a rifle. However, other polymers, like

polycarbonate, may be used and the magazines may be made in any color or opacity (which can reduce or eliminate the need for a magazine level indicator).

Some polymers, such as polycarbonate, may be used without reinforcement.

Steel, carbon fiber, and other materials may also be used to reinforce the

5 magazine. Likewise, the magazine body may be made of other materials having suitable strength and durability, such as titanium, ceramics, laminates, amorphous metals, etc. The follower is preferred to be made of polyoxymethylene, acetal resin available commercially from DuPont under the trade name DELRIN®, though other materials are suitable, just not preferred.

10 The magazine body may also feature improvements to aid the user in other manners (FIG. 1). At least one paint matrix 5 may be added to either the body or floor plate 30 of the magazine. Paint matrix 5 is a plurality of divots in the body of the magazine that, when painted over with some form of mark or indicia, will hold the paint mark within the cavities of the divots. An over-
15 insertion stop 7 (FIG. 9) may also be provided so that the magazine will abut the walls of the magazine well and so prevent over-insertion of the magazine.

Although the present invention has been described with reference to preferred embodiments, numerous modifications and variations can be made and still the result will come within the scope of the invention. No limitation
20 with respect to the specific embodiments disclosed herein is intended or should be inferred.

What is claimed is:

1. An ammunition magazine comprising:
 - a. a casing having a mostly rectangular cross-section with fore and aft sides and two longer lateral sides and first and second open ends;
 - 5 b. a follower residing within the casing, said follower further comprising:
 - i. a follower platform with two opposite tines at fore and aft positions and extending generally perpendicularly and distally therefrom;
 - ii. the aft tine being shorter than the fore tine;
 - 10 c. a floor plate capable of interfacing the casing at the second end and having an orifice;
 - d. a lock plate proximate the floor plate and residing generally within the second end of the casing and further comprising:
 - i. a tab projecting towards an exterior of the casing; and
 - 15 ii. a pillar extending into an interior of the casing along the aft side of the casing; and
 - e. a follower spring residing between the follower and lock plate; wherein spring pressure interfaces the lock plate and the floor plate together by forcing the tab into the orifice and, when the spring is
 - 20 compressed to a maximum designed limit, the pillar and aft tine abut each other to prevent further spring compression.
2. The ammunition magazine of claim 1, the lock plate further comprising a cradle, extending into the interior of the casing along the fore side of the

casing, such that, when the spring is compressed to the maximum designed limit, the fore tine of the follower will nest within the cradle.

3. The ammunition magazine of claim 2, the pillar and aft tine having a combined length comparable to the length of the fore tine.

5 4. The ammunition magazine of claim 2, further comprising a pair of spines located in the interior of the casing along the aft side and extending toward the first open end, said tines flanked by two channels and defining a trench along the aft side of the casing.

5. The ammunition magazine of claim 4, the spines stopping at a point in
10 the casing where exterior geometry of the casing changes to a more straight profile.

6. The ammunition magazine of claim 2, the casing further comprising at least one matrix of divots in an exterior surface of the casing.

7. The ammunition magazine of claim 2, the casing further comprising an
15 over-insertion stop extending outward from an exterior of the casing.

8. The ammunition magazine of claim 1, the pillar and aft tine having a combined length comparable to the length of the fore tine.

9. The ammunition magazine of claim 1, further comprising a pair of spines located in the interior of the casing along the aft side and extending toward the
20 first open end, said tines flanked by two channels and defining a trench along the aft side of the casing.

10. The ammunition magazine of claim 9, the spines stopping at a point in the casing where exterior geometry of the casing changes to a more straight profile.

11. The ammunition magazine of claim 1, the casing further comprising an over-insertion stop extending outward from an exterior of the casing.

12. The ammunition magazine of claim 1, the casing further comprising at least one matrix of divots in an exterior surface of the casing.

5 13. An ammunition magazine comprising:

a. a casing having a mostly rectangular cross-section with fore and aft sides and two longer lateral sides and first and second open ends, the casing further comprising two notches, one located on each of the fore and aft sides and proximate the second open end;

10 b. a follower residing within the casing, said follower further comprising:

i. a follower platform with two opposite tines at fore and aft positions and extending generally perpendicularly and distally therefrom;

ii. the aft tine being shorter than the fore tine;

15 c. a floor plate capable of interfacing the casing at the second end and further comprising;

i. a pillar extending into an interior of the casing along the aft side of the casing and presenting a tooth toward the aft side; and

20 ii. a cradle, extending into the interior of the casing along the fore side of the casing and presenting a tooth toward the fore side; and

d. a follower spring residing between the follower and lock plate;

wherein the teeth on the pillar and cradle interface with the notches on the fore and aft sides of the casing and when the spring is compressed to a maximum designed limit, the pillar and aft tine abut each other to prevent further spring compression and the fore tine of the follower will nest within the cradle.

14. The ammunition magazine of claim 13, the pillar and aft tine having a combined length comparable to the length of the fore tine.

15. The ammunition magazine of claim 13, further comprising a pair of spines located in the interior of the casing along the aft side and extending toward the first open end, said tines flanked by two channels and defining a trench along the aft side of the casing.

16. The ammunition magazine of claim 15, the spines stopping at a point in the casing where exterior geometry of the casing changes to a more straight profile.

17. The ammunition magazine of claim 13, the casing further comprising an over-insertion stop extending outward from an exterior of the casing.

18. The ammunition magazine of claim 13, the casing further comprising at least one matrix of divots in an exterior surface of the casing.

19. An ammunition magazine casing comprising:

- a. a casing body with with fore and aft sides and two longer lateral sides and first and second open ends;
- b. a pair of spines located on an interior of the aft side of the body, towards the second open end, the spines defining a trench that extends at least partly toward the first open end; and

c. a pair of channels, one on either side of a spine.

20. The ammunition magazine casing of claim 19, the spines stopping at a point in the casing where exterior geometry of the casing changes to a more straight profile.