

[54] **RECTILINEAR MAGAZINE**

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Related U.S. Application Data

[63] Continuation-in-part of Ser. No. 868,310, Oct. 22, 1969, abandoned.

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

[51] **Int. Cl.**.....F41c 25/04

[58] **Field of Search**.....42/50, 6, 7

[57] **ABSTRACT**

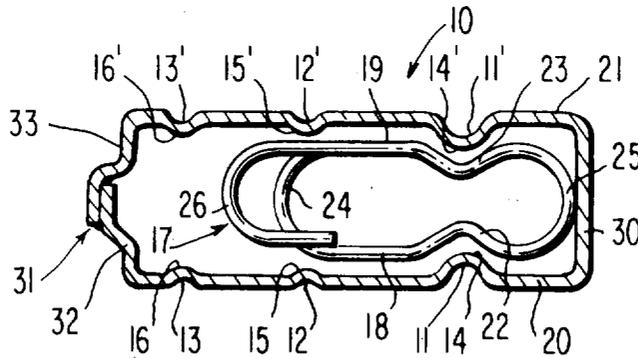
A small arms magazine has a rectilinear form and the arcuate segmental configuration of a stack of nested tapered cartridges is accommodated by a follower loaded by a biasing spring. The spring has a plurality of turns and at each turn a pair of opposed re-entrant portions freely engage opposed complementary internal ridges in opposed side walls of the magazine. The last half turn of the spring is raised at a greater angle than the other turns with the spring in a free state. When full, the follower is inclined at a maximum angle to the closed end of the magazine and this angle decreases progressively toward zero as the magazine is emptied.

[56] **References Cited**

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8 Claims, 4 Drawing Figures



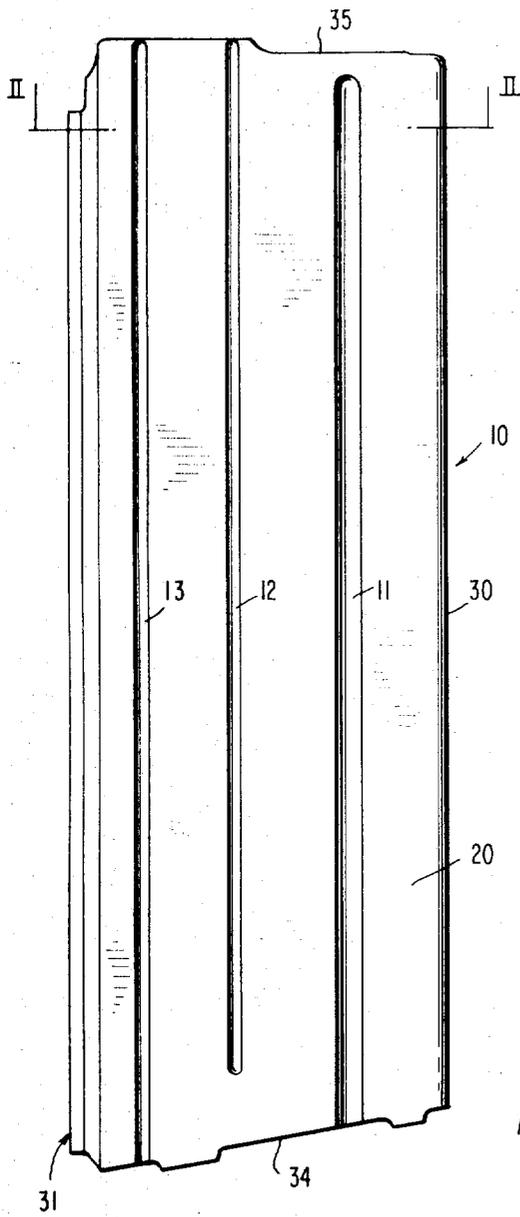


FIG. 1

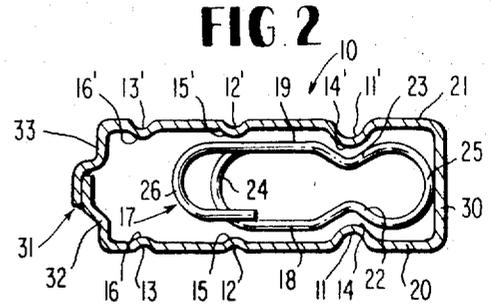


FIG. 2

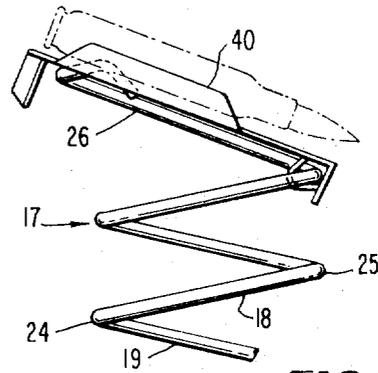


FIG. 3

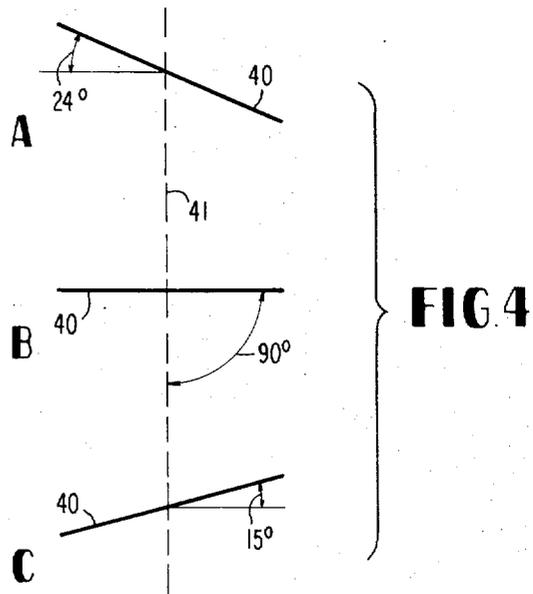


FIG. 4

RECTILINEAR MAGAZINE

This application is a continuation-in-part of application, Ser. No. 868,310, filed Oct. 22, 1969, now abandoned.

BACKGROUND OF THE INVENTION**Field of the Invention**

This invention relates to a small arms ammunition magazine.

SUMMARY OF THE INVENTION

To accommodate the arcuate segmental configuration of either a single or double stack of cartridges, each of which tapers by approximately 1°, it has hitherto been necessary to provide magazines for small arms which are themselves segmental. By this expedient a steady pressure can be exerted by a spring acting through a follower and the cartridges are therefore delivered at the open end of the magazine correctly aligned with respect to the breech of the associated small arm.

Clearly, the utilization of a magazine of rectilinear form throughout its length is desirable, particularly from the manufacturing standpoint, but correct presentation of a delivered cartridge has not hitherto been possible with a magazine of rectilinear form.

It is an object of the present invention to provide a magazine for small arms ammunition which is of rectilinear form, but which nevertheless presents cartridges in succession at the open end of the magazine with a substantially even pressure along the length thereof.

According to the present invention there is provided a small arms magazine comprising an elongate rectilinear casing having a pair of opposed side walls each having at least a first elongate ridge, a base plate, and means defining an opening at the opposite end of the casing from the base plate for dispensing cartridges singly to the breech of a small arm, an elongate spring having a plurality of turns each with two portions, both of which are formed to cooperate slidingly with the respective said ridges of the said side walls, and a follower member rigid with the end of the spring remote from the base plate, the said portions of the turns of the spring and the ridges of the side walls serving to guide the spring and to prevent the spring from sliding toward the rear of the magazine (toward the butt of the weapon) irrespective of its actual length and thereby to accommodate tilting of the follower member from a maximum with the magazine filled to a minimum with the magazine empty. Further, the last half turn of the spring is raised at a greater angle than the other turns with the spring in a free state to place additional pressure on the rear of the follower.

BRIEF DESCRIPTION OF THE DRAWINGS

An embodiment of a small arms magazine in accordance with the invention will now be described, by way of example, with reference to the accompanying diagrammatic drawing, in which:

FIG. 1 is a side elevation of a magazine in accordance with the invention;

FIG. 2 is a cross section on the line II—II of FIG. 1;

FIG. 3 is a fragmentary side elevation of the spring in its free state; and

FIG. 4 is a schematic view showing the different positions of the follower at different conditions of loading.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to the drawings, the magazine 10 comprises a casing having a pair of opposed side walls of rectangular form and each having three spaced longitudinally-extending grooves 11, 12 and 13 and 11', 12' and 13', respectively. The grooves are each of approximately semi-circular cross section, and the first grooves 11, 11', have a diameter equal to approximately twice that of the second and third grooves 12, 12' and 13, 13'. The grooves 11, 11', 12, 12' and 13, 13' lie opposite one another in pairs respectively and, because the magazine is made of sheet metal and the grooves are formed by a pressing operation, each one of the grooves is complemented by an internal ridge or rib 14, 14', 15, 15' and 16, 16'.

The first ridges 14, 14' corresponding to the first grooves serve as guides for a spring 17 of special form now to be described. The spring is basically helical but the turns are each formed as shown in FIG. 2, that is, with two long rectilinear portions 18, 19 extending parallel to the side walls 20, 21 of the magazine, two concave curved portions 22, 23 extending from the rectilinear portions 18, 19 and two semi-circular portions 24, 25, one of which joins the two portions 18, 19 and the other of which joins the two portions 22, 23. The upper one-half turn or terminal turn 26 of the spring has been extended and raised at a greater angle than the other turns with the spring in a free state in order to deliver additional pressure to the rear of the follower when nearly empty. As the cartridges are expended, the weight exerted on the front of the follower is reduced as is the amount of aggregate taper. This would normally lead to a nose-up condition for the last 10 cartridges. The additional one-half turn, however, removes the possibility of experiencing excessive pressure at the magazine front.

A follower 40 is secured to the top half turn or terminal turn of the spring and bears against the bottom of the stack of cartridges, one of which is shown in dotted lines in FIG. 3.

As illustrated schematically in FIG. 4, the follower assumes different positions at different conditions of loading. In condition A the follower 40 is shown in the position it assumes when spring 17 is in a free state. In this condition the follower 40 slopes forwardly and downwardly at an angle of about 24° to the horizontal. In condition B the follower is shown in the position when installed in the magazine, with the magazine empty of cartridges. The follower 40 in this condition bears against the conventional lips at the top of the magazine and is horizontal or at 90° to the vertical centerline 41. In condition C the follower 40 is shown in the position it assumes with the magazine fully loaded. In this condition the follower 40 slopes forwardly and upwardly at an angle of about 15° to the horizontal.

Thus, as the cartridges are urged to the top of the magazine for delivery from the open end the follower gradually changes from the position of condition C to the position of condition B. However, since in relaxed position the spring tends to slant the follower in the position of condition A, it will be appreciated that at all

times the follower exerts more pressure on the rear of the cartridges than on the front, thus preventing a nose-up condition of the cartridges.

The by walls 20, 21 of the magazine are joined to one another by a front wall 30 and a shaped rear wall 31. 5 The rear wall 31 is formed substantially by two portions 32, 33, of crank-section, the portion 32 having a smaller intermediate limb than the portion 33. One limb of each crank-section portion 32, 33 overlaps the corresponding limb of the other crank-section portion 10 and these two limbs are joined together along their lengths.

The magazine casing is completed by a base plate 34 and a contoured top portion 35 which has an opening 15 for dispensing the cartridges one by one into the small arm in which the magazine is mounted. The opening is of conventional form for small arms magazines and similarly the follower member which contacts the lowermost cartridge and is secured to the spring is of 20 conventional form.

The grooves and complementary internal ridges provide the convention reinforcing purpose, prevent excess friction with the cartridges and the first ridges 14, 14' act as guides for the spring throughout its length 25 and irrespective of its degree of compression and prevent its sliding toward the rear of the magazine or buckling.

It follows that the rectilinear form of the magazine casing enables particularly straightforward manufacturing techniques to be employed, especially with regard to the fabrication and joining operations and that the spring form and cooperating ridges ensure correct feed of the arcuate stack of cartridges to the dispensing opening irrespective of the number of cartridges in the magazine. The joining operation can be carried out on an automatic welding machine. 30

The magazine can be employed with a stack made of a single row of cartridges or, as a so-called high-capacity magazine with the stack formed by two rows of cartridges with those of one row staggered with respect to the other row and thus partially interdigitating. The latter magazine can carry 30 or more cartridges and is suitable for use with the M-16 rifle of the United States Army or any other small arm utilizing a tapered cartridge. 35

That which is claimed is:

1. A small arms magazine comprising

an elongate rectilinear casing having
a pair of opposed side walls each having at least a first elongate ridge,
a base plate, and
means defining an opening at the opposite end of the casing from the base plate for dispensing cartridges singly therefrom,
an elongate spring having a plurality of turns with two portions formed therein to cooperate slidingly with a respective ridge on each side wall, and
a follower member rigid with the end of the spring remote from the base plate,
the said portions of the turns of the spring and the ridges of the side walls serving to guide the spring irrespective of its actual length and thereby to accommodate tilting of the follower member from a maximum with the magazine filled to a minimum with the magazine empty.

2. A magazine according to claim 1, wherein said ridges are internal and said spring portions are concave.

3. A magazine according to claim 1, wherein said first ridges lie opposite one another.

4. A magazine according to claim 1, wherein each side wall has second and third rectilinear ridges.

5. A magazine according to claim 1, wherein each turn of the spring is of elongated form and includes a pair of opposed straight portions,

a pair of opposed concave portions each of which forms a continuation of one of the straight portions, and

a pair of opposed semi-circular end portions, one of said end portions serving to join the concave portions and the other of said end portions serving to join the straight portions.

6. A magazine according to claim 1, wherein the spring exerts greater pressure on the back of the follower than on the front.

7. A magazine according to claim 6 in which the upper terminal turn of the spring, when in its free state, is raised at a greater angle than the other turns in order to exert said greater pressure on the back of the follower.

8. A magazine according to claim 4, wherein said rectilinear ridges are disposed internally of the magazine.

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