

AMMUNITION BOX AND AMMUNITION MAGAZINE INTENDED TO RECEIVE
SUCH A BOX

The invention relates to the technical field of ammunition
5 boxes as well as magazines intended to receive such boxes.

It is known to define gun turrets that are equipped with
ammunition magazines containing several removable ammunition
boxes.

Such an arrangement indeed makes it possible to facilitate
10 the resupply of the weapon. The boxes have a reduced volume
and a reduced mass. They are supplied with ammunition in
strips made up of links. They are next arranged in the
magazine of the weapon, and the strips are connected to one
another, from one box to the next.

15 Patent US3788189 describes one such type of turret equipped
with two ammunition boxes fastened laterally in a magazine.

Patent application FR3052247 also describes a turret
comprising two lateral magazines, each magazine being able to
receive several ammunition boxes.

20 This last turret further has the particularity of being
able to receive the boxes inserted vertically or horizontally.

In all cases, the problem arises of securing the box and
the magazine.

It is in fact necessary to prevent the boxes from moving
25 during firing or during movements of the vehicle bearing the
turret.

To that end, patent application FR3052247 proposes to
dispose spacers between two panels of the magazine, wherein
these spacers delimit housings intended to receive the boxes.
30 The boxes that can be inserted horizontally are also
maintained owing to the rear door of the magazine.

Such a solution does not keep a box in a given location
reliably enough. Furthermore, the spacers hinder the
horizontal insertion of the boxes and, concretely, only two

boxes can be inserted horizontally, all of the others having to be inserted vertically.

It is the aim of the invention to propose an ammunition box, as well as a magazine suitable for receiving such a box,
5 and which do not have such drawbacks.

Thus, with the box and the magazine according to the invention, the boxes are fastened reliably in locations that are defined upon the design of the weapon system.

The placement and removal of the boxes do not require any
10 particular tool, the simple maneuvering of the handle of the box sufficing to ensure the locking or unlocking of the box.

Thus, the invention relates to an ammunition box that is intended to equip a magazine of a gun turret, which box is substantially parallelepipedic and comprises two front walls
15 that are parallel to one another and two side walls that are parallel to one another and perpendicular to the front walls, the box comprising a pivoting handle formed by two arms articulated on the side walls and connected by a grip allowing the extraction and transportation of the box, which box is
20 characterized in that the handle comprises a protuberance provided at at least one of the articulated arms and in the vicinity of its pivot pin on the walls, which protuberance is intended to engage with at least one guide groove provided on the magazine of the turret.

25 According to one embodiment, the protuberance may form a prismatic overthickness machined in the arm.

According to another embodiment, the overthickness may be made in the form of a small plate fastened to one of the arms.

According to another embodiment, the protuberance may be
30 made in the form of tongues cut and bent in the arm.

Preferably, the protuberance may comprise rounded ends.

The invention also relates to an ammunition magazine secured to a gun turret and intended to receive at least one ammunition box according to the invention, the magazine

comprising at least two panels delimiting an inner volume able to receive the box or boxes, which magazine is characterized in that at least one of the panels comprises at least one groove that emerges on at least one substantially cylindrical housing, the groove being intended to ensure the guiding of the protuberance of the handle of a box, the cylindrical housing being intended to cooperate with the protuberance so as to ensure locking of the box once the latter is placed and the grip of the handle is tilted in low position.

According to one embodiment, the panel may include at least one vertical groove allowing the insertion of at least one box into the magazine in a vertical direction.

According to another embodiment, the panel may include at least one horizontal groove allowing the insertion of at least one box into the magazine in a horizontal direction.

According to one preferred embodiment, a magazine that is intended to receive at least two ammunition boxes disposed adjacent to one another will have a panel that comprises a horizontal groove and at least two vertical grooves, each vertical groove emerging on the horizontal groove in the vicinity of a separate cylindrical housing.

The invention will be better understood upon reading the following description of one particular embodiment, the description being done in reference to the appended drawings and in which:

- Figure 1 is a perspective view of a box according to one embodiment of the invention;
- Figure 2 is an enlarged view of the box and its handle, view of the zone surrounded by the circle identified A in figure 1;
- Figure 3 is a partial perspective view of a magazine intended to receive boxes;
- Figure 4 is an enlarged view showing the panel of the magazine bearing the grooves;

- Figure 5a shows a box placed in the magazine and in the locked position;
- Figure 5b shows a box placed in the magazine and in the unlocked position, before horizontal movement;
- 5 - Figure 5c shows a box placed in the magazine and in the unlocked position, before vertical movement;
- Figures 6a and 6b show two variants of embodiment of a panel of a magazine according to the invention;
- Figures 7a and 7b are two detail views showing the end
10 of an arm bearing a protuberance according to one embodiment of the invention, figure 7a being a sectional view along the section plane identified BB in figure 7b;
- Figures 8a and 8b are two detail views showing the end
15 of an arm bearing a protuberance according to another embodiment of the invention, figure 8a being a sectional view along the section plane identified CC in figure 8b.

In reference to figures 1 and 2, an ammunition box 1 according to the invention is intended to equip a magazine of
20 a gun turret (not shown).

This box 1 is substantially parallelepipedic and comprises two front walls 2a and 2b that are parallel to one another and two side walls 3a and 3b that are also parallel to one another and perpendicular to the front walls.

25 The box 1 comprises a pivoting handle 4 that is formed by two arms 5a and 5b articulated on the side walls 3a and 3b and connected by a grip 6 allowing the extraction and transportation of the box 1. Each arm 5a or 5b can pivot on one of the side walls 3a or 3b at a pivot pin 8. The pivot pin
30 8 comprises a mechanical fastening element, for example a rod comprising a threaded part receiving a nut (not shown). The figures show, in the form of a broken line, only the geometric outline of the pivot pin 8.

As described in patent application FR3052247, the grip 6 is mounted freely pivoting on a pivot pin 7. When the grip 6 is folded over toward a front part 2a or 2b of the box 1, the pivot pin 7 bears against the box 1 at notches 9 (see also figure 5a). The grip 6 is then positioned above the inner volume 10 of the box 1 and can pivot freely at this place. The grip 6 thus forms a roller making it possible to guide a strip of ammunition (not shown) between a box 1 and its neighbor, while reducing friction. It is possible to provide for an assembly of the grip 6 on a needle bearing to facilitate this pivoting.

As shown more particularly in figure 2 and figures 7a and 7b, one of the arms 5 of the handle 4 comprises a protuberance 11 that is provided in the vicinity of its pivot pin 8 on the wall 3a.

The protuberance 11 here is made in the form of a prismatic overthickness obtained directly by machining of the arm. The protuberance could alternatively be a small plate 11 fastened to one of the arms 5a (glued or welded). The protuberance 11 (or the small plate) is substantially parallelepipedic and comprises rounded ends 11a.

In the remainder of the disclosure, the terms "protuberance" and "small plate" will be associated with one another, what is disclosed in fact applying indifferently to a protuberance monobloc with the arm or to a small plate attached on the arm.

Figures 7a and 7b more specifically show the protuberance 11 machined in the arm. The hole 21 allows the passage of a threaded rod secured to the pivot pin 8.

If the protuberance 11 is made in the form of an attached small plate, it can simply be pinched on the arm by a nut (not shown) during the assembly of the pivot pin 8.

As shown in figure 3, the box 1 is intended to be placed in an ammunition magazine 12. This magazine 12 is secured to a

gun turret (not shown). Reference may be made to patent application FR3052247, which provides a detailed description of such a turret.

5 The magazine 12 is intended to receive several ammunition boxes 1 (here, two boxes are shown). The magazine 12 includes at least two panels 13a and 13b that delimit an inner volume 14 able to receive the box or boxes 1.

10 As shown in figures 3 and 4, the panels 13a and 13b are open-worked to reduce their mass. They are connected by a bottom plate 15 and spacer strips 16 also connect them at their upper ends. The panels 13a, 13b, the bottom plate 15 and the strips 16 are fastened to one another, for example by welding.

15 As shown more clearly in figure 4, the panel 13a includes a horizontal groove 17 that extends over the entire length of the panel 13a.

20 The panel 13a also bears five vertical grooves 18 spaced apart evenly, the distance separating two vertical grooves 18 is substantially equal to the width of the side walls 3a, 3b of the box.

Cylindrical housings 19 are disposed at the end of the vertical grooves 18 and they are passed through by the horizontal groove 17.

25 The grooves 17 and 18 and the housings 19 are made by milling of the panel 13a. The width of the vertical grooves 18 is equal to that of the horizontal groove 17 and also the width l of the protuberance (or small plate) 11 (cf. figures 7a and 7b).

30 The diameter of the housing 19 is equal to the length L of the protuberance (or small plate) 11.

Thus, the grooves 17 or 18 can ensure the guiding of the protuberance (or small plate) 11 of the handle 4 of a box 1.

In reference to figure 5c, which shows the placement of a box 1 in a vertical direction V , one can see that, when the

grip 6 of the handle 4 of the box is in the upper position, that is to say, with the arms 5a and 5b vertical, the protuberance (or the small plate) 11 is housed in the considered groove 18, which allows the lowering of the box
5 into the magazine 12.

Furthermore, the groove 18 ensures that the arms 5a and 5b are maintained in their vertical position.

In light of figure 5a, when the protuberance (or the small plate) 11 is positioned in the cylindrical housing 19, the
10 groove 18 no longer keeps the arms 5a and 5b vertical, and the latter can tilt and the grip 6 of the handle 4 is then in its low position.

It will be noted that in this position, the protuberance (or the small plate) 11 forms an angle of about 45° between
15 the vertical and horizontal directions. The protuberance (or the small plate) 11 is maintained by the cylindrical housing 19, the diameter of which is substantially equal to the length L of the protuberance (or small plate) 11.

The box 1 is therefore blocked in its position and can no
20 longer move vertically or horizontally.

The cylindrical housing 19 thus cooperates with the protuberance (or the small plate) 11 so as to ensure locking of the box 1 once the latter is in place, and the grip 6 of the handle 4 is tilted in the low position.

25 As shown in figure 5b, it is also possible to place a box 1 in a horizontal direction H. It suffices to position the box at one end of the magazine 12 while keeping the handle 4 with its arms 5a and 5b horizontal. In this case, the protuberance (or the small plate) 11 is positioned in the horizontal groove
30 17, which ensures that the arms 5a and 5b are kept in their horizontal position.

When, after pushing of the box 1, the protuberance (or the small plate) 11 is positioned in a cylindrical housing 19, the groove 17 no longer keeps the arms 5a and 5b horizontal, and

the latter can tilt and the grip 6 of the handle 4 is then in its low position.

Owing to the invention, the box 1 is effectively locked in a location intended to receive it, whether the box is placed
5 vertically or horizontally.

During a horizontal placement of several boxes, it suffices to raise the handle in order to pass a first cylindrical housing 19 and be able to fasten the box further away, in the vicinity of another cylindrical housing 19.

10 Here, the positioning of a protuberance (or small plate) 11 on only one of the arms 5a has been described. Furthermore, there are grooves 17 and 18 on only one of the two panels 13a or 13b.

This solution advantageously makes it possible to ensure
15 mistake-proofing during the placement of the boxes. Indeed, due to the presence of the protuberance (or of the small plate), the box can only be inserted with the orientation allowing the insertion of the protuberance (or of the small plate) in the considered groove 17 or 18.

20 It is of course possible to provide such a protuberance (or small plate) 11 on each of the arms 5a and 5b. In this case, grooves 17 and 18 and cylindrical housings 19 will be made on both panels 13a and 13b. Such a variant makes it possible to balance the locking forces between the two panels.

25 An embodiment has also been disclosed here in which the magazine 12 bears at least one horizontal groove 17 and vertical grooves 18. This embodiment allows the placement of the boxes 1 in the magazine 12, in horizontal or vertical directions indifferently.

30 It is also possible, as shown in figure 6a, to make a magazine 12 that does not comprise vertical grooves. In this case, the boxes will only be able to be inserted horizontally. The horizontal groove(s) 17 will bear, at regular intervals,

cylindrical housings 19 embodying the locking positions for the boxes.

Conversely, it is also possible, as shown in figure 6b, to make a magazine that does not comprise horizontal grooves. In this case, the boxes will only be able to be inserted vertically. Each vertical groove 18 will bear, at its end, a cylindrical housing 19 embodying the locking position for the box.

As a variant, it is possible to produce the protuberance 11 in a form other than a machined overthickness or an attached small plate.

It will for example be possible to make, on the arms 5a, 5b, cuts and bends located to embody the ends of the protuberance 11.

Figures 8a and 8b show such a variant in which the end of one arm 5a bears two tongues 20, cut in the very material of the arm 5a, and bent. Each tongue 20 thus includes a flat part 20a substantially parallel to the arm 5a and an inclined part 20b that connects the flat part 20a to the arm 5a.

The tongues 20 are disposed symmetrically relative to a plane P, perpendicular to the arm 5a, and passing through the hole 21 receiving the pivot pin 8.

The tongues 20 thus protrude relative to the arm 5a and form the protuberance 11. They have a width 1 substantially equal to that of the grooves 17 and 18 borne by the magazine 12.

The length L separating the ends of each tongue is also substantially equal to the diameter of the housing 19 in which the one or more grooves 17 and/or 18 emerges.

The tongues 20 are, like in the preceding embodiment, guided by the grooves 17 and 18 and they make it possible, through their cooperation with the housing 19, to lock an ammunition box in a magazine.

CLAIMS

1- An ammunition box (1) that is intended to equip a magazine (12) of a gun turret, which box is substantially
5 parallelepipedic and comprises two front walls (2a, 2b) that are parallel to one another and two side walls (3a, 3b) that are parallel to one another and perpendicular to the front walls, the box comprising a pivoting handle (4) formed by two arms (5a, 5b) articulated on the side walls (3a, 3b) and
10 connected by a grip (6) allowing the extraction and transportation of the box (1), which box is **characterized in that** the handle (4) comprises a protuberance (11) provided at at least one of the articulated arms (5a, 5b) and in the vicinity of its pivot pin (8) on the walls, which protuberance
15 is intended to engage with at least one guide groove (17, 17) provided on the magazine of the turret (12).

2- The ammunition box according to claim 1, characterized in that the protuberance (11) forms a prismatic overthickness machined in the arm (5a, 5b).

20 3- The ammunition box according to claim 1, characterized in that the overthickness (11) is made in the form of a small plate fastened to one of the arms (5a, 5b).

4- The ammunition box according to claim 1, characterized in that the protuberance (11) is made in the
25 form of tongues (20) cut and bent in the arm (5a, 5b).

5- The ammunition box according to one of claims 1 to 4, characterized in that the protuberance (11) comprises rounded ends (11a).

6- An ammunition magazine (12) secured to a gun turret
30 and intended to receive at least one ammunition box (1) according to one of the preceding claims, the magazine comprising at least two panels (13a, 13b) delimiting an inner volume (14) able to receive the box or boxes, which magazine is **characterized in that** at least one of the panels (13a, 13b)

comprises at least one groove (17, 18) that emerges on at least one substantially cylindrical housing (19), the groove (17, 18) being intended to ensure the guiding of the protuberance (11) of the handle (4) of a box (1), the
5 cylindrical housing (19) being intended to cooperate with the protuberance (11) so as to ensure locking of the box (1) once the latter is placed and the grip (6) of the handle (4) is tilted in low position.

7- The ammunition magazine according to claim 6,
10 characterized in that the panel (13a, 13b) includes at least one vertical groove (18) allowing the insertion of at least one box (1) into the magazine (12) in a vertical direction.

8- The ammunition magazine according to one of claims 6 or 7, characterized in that the panel (13a, 13b) includes at
15 least one horizontal groove (17) allowing the insertion of at least one box (1) into the magazine (12) in a horizontal direction.

9- The ammunition magazine according to claims 7 and 8 and intended to receive at least two ammunition boxes (1) disposed adjacent to one another, characterized in that the
20 panel (13a, 13b) comprises a horizontal groove (17) and at least two vertical grooves (18), each vertical groove (18) emerging on the horizontal groove (17) at a separate cylindrical housing (19).