

Dec. 13, 1966

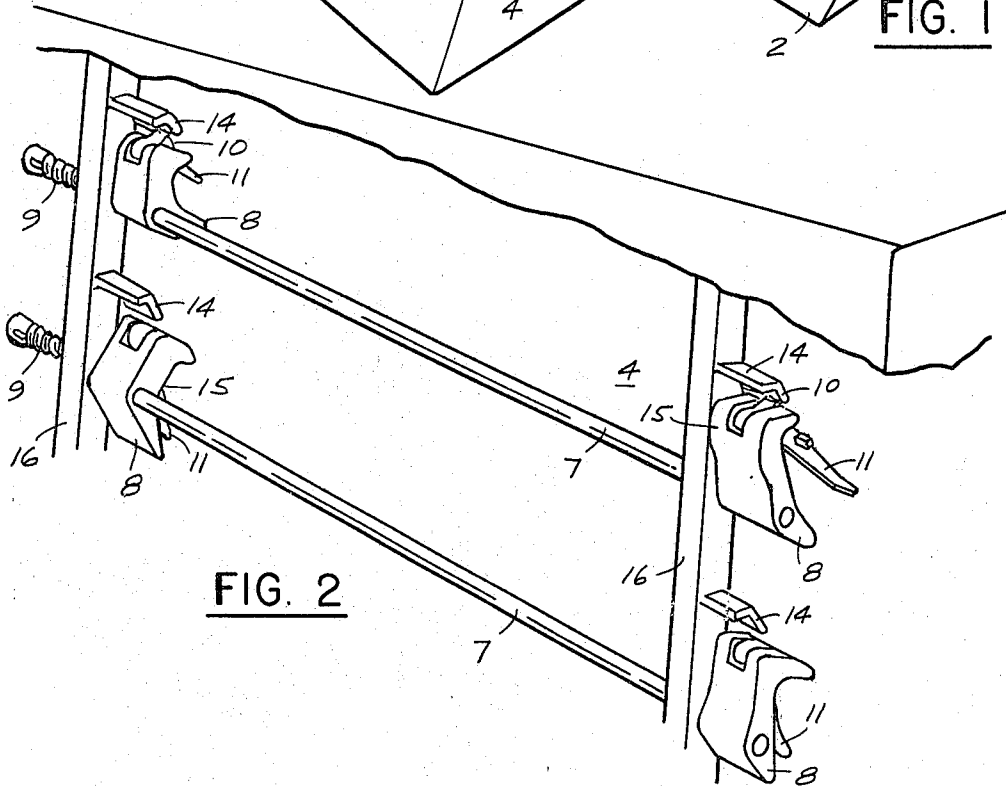
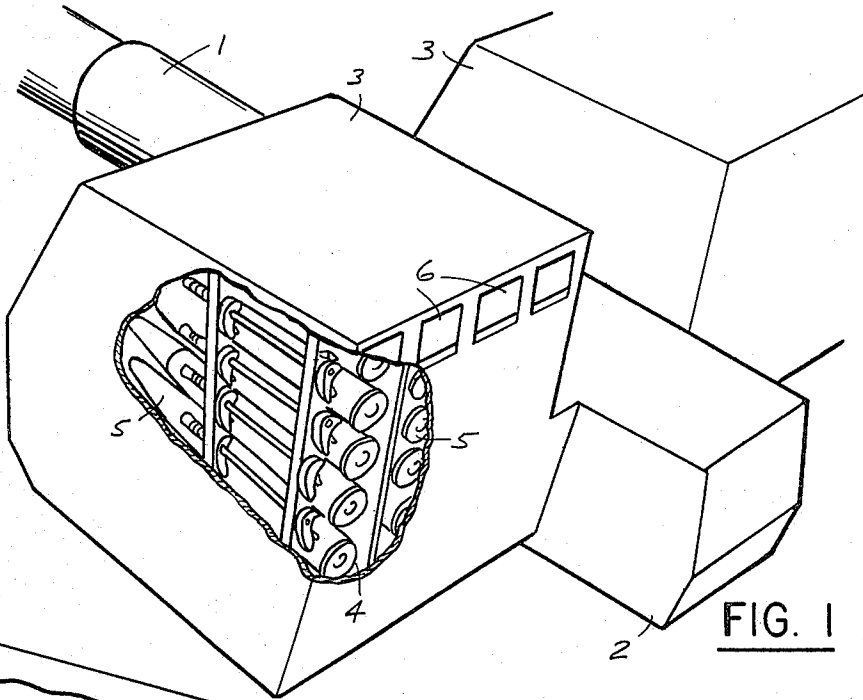
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CARTRIDGE MAGAZINE FOR A GUN

Filed May 10, 1965

2 Sheets-Sheet 1



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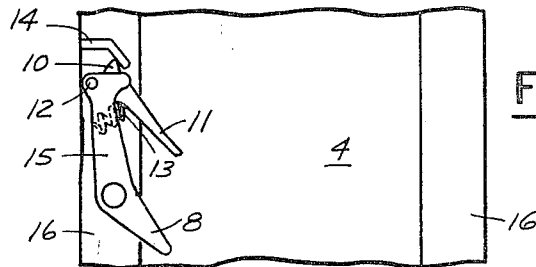


FIG. 3

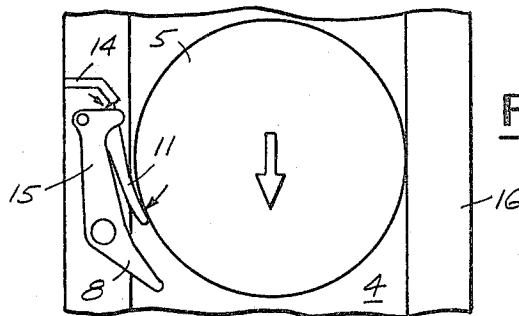


FIG. 4

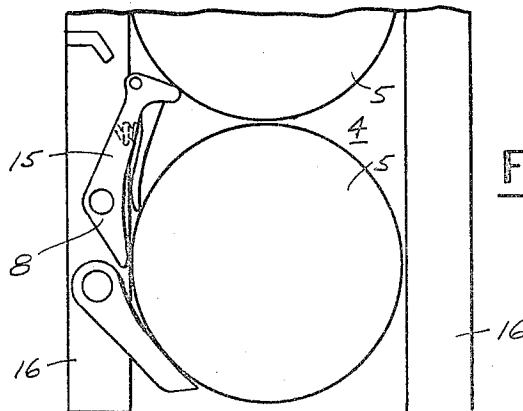


FIG. 5

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CARTRIDGE MAGAZINE FOR A GUN

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4 Claims. (Cl. 89—34)

The invention relates to a cartridge magazine for an automatic gun, and more particularly to cartridge magazines of the type comprising one or more compartments in the form of vertical cartridge chutes in which cartridges are arranged in a vertical row on top of each other, the longitudinal axis of each cartridge extending essentially horizontally, and in which the cartridges are gravity fed downwardly in the compartment after a cartridge located at the bottom of the compartment has been fed out of the compartment.

In cartridge magazines of the kind described it is essential for a smooth descent of the cartridges through the compartment that the cartridges move downwardly without tilting from the intended essentially horizontal position in the compartment. Even a comparatively small rotation of a cartridge in a vertical plane through the compartment about an axis perpendicular to the longitudinal direction of the cartridge axis may cause a blocking of the downward motion of the cartridges, or other difficulties.

An object of the present invention is to provide means for bringing a cartridge to an intended position in the magazine after each successive downward motion in the compartment between one cartridge site and a lower one, and for releasing the cartridge for a further motion downward in the compartment after, but not earlier than, the cartridge has been brought to its proper position for starting said further downward motion in the compartment.

With this object in view, the invention provides a device comprising, in combination, a cartridge-retaining means which is pivotal about an axis located sidewise of the path along which the cartridges are to pass downwardly through the compartment. The retaining means comprise at least two cartridge-retaining arms which are arranged to be pivotal as a unit into the path of cartridges through the compartment by action of a directional force means and out of the way of a cartridge by action of the weight of the cartridge. The cartridge-retaining arms are located at such a distance from each other horizontally in the longitudinal direction of the compartment that the middle of a cartridge is located between the arms. Each one of said two arms comprises a displaceable retaining member cooperating with a stationary abutment to prevent pivoting of the arms out of the path of a cartridge by the influence of the weight of a cartridge against the action of said directional force in a first position of said displaceable retaining member, and each one of said retaining members comprises a releasing means located above the retaining arm in the path of a cartridge moving downward toward the arm to cooperate with and be actuated by a cartridge for releasing the retaining member shortly before a portion of a cartridge passing down through the compartment contacts said cartridge-retaining arm. The releasing means are each located a distance from and above the retaining arm. This distance is selected so that a cartridge, after having moved into contact with the other retaining arm and thus first having actuated the releasing means pertaining thereto, arrives in a position in the compartment which is within the acceptable tolerance for an oblique cartridge position in the compartment.

By means of this arrangement the result is attained that

a cartridge, if rotating through an angle backwardly or forwardly in a longitudinal vertical plane while moving downwardly in the compartment, will hit against one of the retaining arms protruding into the compartment after having first released the retaining means thereof. The two retaining arms cannot, however, be swung out of the way of a cartridge before the retaining member of the second retaining arm has been released. Such release is not effected before the trailing portion of the cartridge which is possibly far behind during the downward movement of the cartridge has been swung so far downwardly in the direction toward the second retaining arm as to actuate the releasing means of the retaining member pertaining thereto. Thus, a releasing of the cartridge for further movement downwardly in the compartment is prevented until it has been brought into a position which is within the tolerances determined by the distance over which a portion of the cartridge may move after having actuated the releasing means of an arm-retaining member and until it contacts the pertaining arm.

In a preferred embodiment of a device according to the invention each one of the pivotal cartridge-retaining arms constitutes part of a two-armed lever, a first arm of which is rotatable into a position protruding into the compartment by action of the directional force means. The second arm of the lever extends upwardly from the first arm so as to be swung into the chute space and thus into the path of a succeeding cartridge as the first arm is swung out of the path of a cartridge by influence of the weight thereof, and to be swung out of the way of a succeeding cartridge, by action of the directional force, as soon as a cartridge, when being released for further movement downwardly has moved out of contact with the first arm after the disengagement of the retaining member. A succeeding cartridge, which may have been released by a previous cartridge-retaining means of the same construction as that described, and which due to the presence of a cartridge in a lower cartridge position, is prevented from moving downwardly, will thus hold the cartridge-retaining means against the action of the directional force means, the said first arms of the retaining means being swung out of the compartment space and the second arms of the retaining means thus protruding into the compartment space, thereby constituting a support for the succeeding cartridge.

The invention will be further illustrated by the following description of a preferred embodiment thereof as shown in the accompanying drawing, in which:

FIG. 1 is a fragmentary view of a gun having a cartridge magazine comprising a number of cartridge compartments extending vertically and being subdivided into two portions located on either side of the barrel and a cartridge-ramming apparatus of the gun;

FIG. 2 is a perspective view of cartridge-retaining means according to the invention arranged on top of each other in a side wall of the vertical cartridge compartment, and

FIGS. 3, 4 and 5 show details of the cartridge-retaining means in different positions during the downward motion of a cartridge in the vertical compartment.

FIG. 1 schematically illustrates a cartridge magazine comprising a device according to the invention in connection with an automatic gun, of which only the barrel 1 and an enclosure 2 for the cartridge-ramming means of the gun are illustrated. In this embodiment, the cartridge magazine comprises two magazine parts 3, each having means for feeding cartridges along the bottom thereof to the ramming means contained in the enclosure 2. Said means are not further illustrated, as not constituting part of the invention.

The cartridge magazine comprises a plurality of vertical cartridge compartments 4, each containing cartridges

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5 located above each other in vertical rows to be fed downwardly in the compartment and sidewise along the bottom thereof to the ramming means of the gun. The cartridges are introduced into the magazine through a port 6, for instance, for each compartment 4. If the cartridges, when introduced through a port 6, were permitted to move freely downwardly through the chutes formed by the compartments, the cartridges would occupy an oblique position, resulting in a blocking of the downward motion of the cartridges.

In order to prevent such blocking, the magazine comprises releasable cartridge-retaining means according to the invention arranged in the downward path of a cartridge in the compartment. Preferably, one such cartridge-retaining means is arranged for each intended cartridge position in the compartment.

In the embodiment illustrated in the drawing, each releasable cartridge-retaining means comprises at least two cartridge-retaining arms 8 which are pivotal about an axis extending substantially parallel to the intended position of the cartridge within the compartment into and out of the path of a cartridge through the compartment, and which are fixedly secured to a common shaft 7. The arms 8 are movable, for instance, by the action of a directional force of a torsion spring 9, into the positions shown by the uppermost retaining means of FIG. 2 and in FIGS. 3 and 4—that is, into positions extending into the path of a cartridge moving downwardly through the compartment—and, against the action of this directional force, into positions illustrated by the lowermost retaining means of FIG. 2 and in FIG. 5. Each cartridge-retaining arm 8 comprises a retaining member 10 having a releasing means 11, the releasing means 11 of each retaining arm 8 being located in the path of a cartridge moving downwardly toward the arm. The retaining member 10 of each retaining arm 8 is rotatable about a pivot 12, a spring 13 tending to bias the retaining member 10 into a position in which it engages a stationary abutment bracket 14 attached to a support member 16 sidewise of the cartridge space in the compartment.

In the position of the retaining arm 8 in which it extends into the path of a cartridge moving downwardly in the compartment, the retaining member 10 is in a position to engage the stationary abutment bracket 14. In the embodiment as illustrated, each retaining member 10 is mounted on an extension arm 15 of arm 8 extending from shaft 7 upwardly thereof, said arm 15 being arranged relative to arms 8 so that arm 15 is swung into the path of a successive cartridge when arm 8 is swung out of this path by the action of a cartridge moving downwardly past the retaining arm 8. Arm 15 is retained in this position by the action of the cartridge as long as the cartridge has not moved so far downwardly that arms 8 are again free to swing back into the compartment by the action of spring 9. Thus each cartridge contained in the compartment will be carried individually by each one retaining means 7, 8 as long as a previous, underlying cartridge is still in the way of the retaining means for a following cartridge. Accordingly, the cartridges located within the compartment are all supported individually by the compartment walls defined by the vertical supports 16 in which the cartridge-retaining means and the stationary abutment brackets 14 are mounted.

The function of the device is as follows:

Assuming that a compartment is empty, all cartridge-retaining means 7, 8 occupy the position illustrated by the uppermost retaining means of FIG. 2 and in FIG. 3. When now a cartridge is introduced into the compartment in the top portion thereof, such cartridge, if introduced obliquely with the front or rear end thereof tilting downwardly, engages a releasing means 11 of the retaining member 10 adjacent the lower end of the cartridge, the retaining arm 8 pertaining thereto thus being released from engagement with the stationary abutment bracket 14 shortly before said end of the cartridge abuts against

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the arm. The lower end of the cartridge cannot, however, move further downwardly through the compartment, due to the fact that arm 8 cannot move out of the path of the cartridge, since the retaining member 10 adjacent the opposite and higher end of the cartridge is still holding the retaining means 7, 8 in its position with both arms 8 extending into the compartment. Accordingly, the second retaining means 7, 8 is not released, and arms 8 are not freed to swing out of the path of the cartridge, due to the weight of the cartridge and against the action of spring 9, until the other end of the cartridge has descended far enough to actuate the releasing means 11 of the second retaining member 10, which is still in engagement with its pertaining stationary abutment bracket 14. The cartridge is thus free to move further downwardly through the compartment. When the cartridge moves downwardly in a manner such that the releasing means 11 of both retaining means 7, 8 are actuated at the same time, the cartridge will proceed downwardly toward a lower retaining means. If, however, the cartridge tilts over into an oblique position while falling downwardly, it is retarded and brought into the correct position by the action of the retaining means before being left free to move further downwardly to the following retaining means.

Since the compartment is loaded with successive cartridges, the cartridges occupying a lower position will stop in a position in which arms 8 are swung out of their path, as is illustrated in FIG. 5. If the cartridge-retaining means, as is the case in the embodiment illustrated in the drawings, comprises additional arms such as arms 15, these additional arms 15 are swung into the path of a following cartridge and retain it in position, resting on top of the arms 15.

As soon as a lowermost cartridge in a compartment leaves its position for being fed toward the ramming means of the gun, the cartridges on top thereof in the compartment move downwardly, each by one step, the retaining means executing a sequence of rotational movements successively freeing a cartridge to fall down, beginning with the cartridge next to the one fed out of the compartment.

While the invention has been described in detail with respect to certain preferred examples and embodiments thereof, it will be understood by those skilled in the art, after understanding the invention, that various changes and modifications may be made without departing from the spirit and scope of the invention, and it is intended, therefore, to cover all such changes and modifications in the appended claims.

What is claimed is:

1. A cartridge magazine for a gun, said magazine comprising, in combination, a casing including a cartridge compartment for stacking therein a plurality of horizontally disposed cartridges in a vertical row and for discharging successive lowermost cartridges from the casing, a cartridge-retaining means, mounting means supporting said retaining means pivotal about an axis parallel to said vertical row of cartridges spaced apart therefrom, said retaining means including at least two retaining levers jointly pivotal into and out of the path of cartridges descending in said compartment, said levers being disposed on lengthwise opposite sides of the midpoints of the stacked cartridges, yieldable means biasing said levers into the path of descending cartridges, the weight of cartridges acting upon the levers biasing the same out of said path against the action of said yieldable means, a displaceable retaining member on each lever for controlling the pivotal position thereof, a stationarily mounted abutment member for each retaining member coacting with the same to block in a first position of the respective retaining member pivotal movement of the respective lever out of the path of the cartridges by the weight of a descending cartridge and against the action of the respective yieldable means, each of said retaining members in-

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cluding a release means disposed above the respective retaining lever and in the path of a cartridge descending toward said lever, said releasing means being actuated by a descending cartridge to release the respective retaining member shortly before an end part of a cartridge descending in the compartment at a slant engages the respective lever by displacing the retaining member into a second position in which the retaining member is freed of said abutment member, the distance of each of said releasing means above the respective retaining lever being at most such that a cartridge having engaged one of said retaining levers with said one end part and having actuated the release means associated therewith engages the other retaining lever with its other end part and actuates the releasing means associated with said other lever only after having been turned about its lengthwise axis into a position in which the slant of the cartridge in reference to the horizontal position is within a predetermined limit.

2. A cartridge magazine according to claim 1, wherein several of said retaining means are provided in said com-

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partment in vertical arrangement, each of said retaining means coacting with successive descending cartridges.

3. A cartridge magazine according to claim 1, wherein each of said pivotal retaining levers is a two-arm lever, one arm of each lever being movable into and out of the path of descending cartridges and the other arm extending upwardly in reference to said one arm and being positioned to extend into the path of a cartridge when said one arm is pivoted out of said path by the cartridge next preceding said cartridge and to be pivoted out of the path of the cartridge following said preceding cartridge by the action of the respective yieldable means.

4. A cartridge magazine according to claim 3, wherein one displaceable retaining member is pivotally supported on said other arm of each of said two-arm levers.

No references cited.

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