Feb. 12, 1946. A. GAZDA 2,394,606

AUTOMATIC FEED MECHANISM FOR LOADING ORDNANCE, TOOLS, AND THE LIKE

Filed Feb. 17, 1943

FIG. 1.

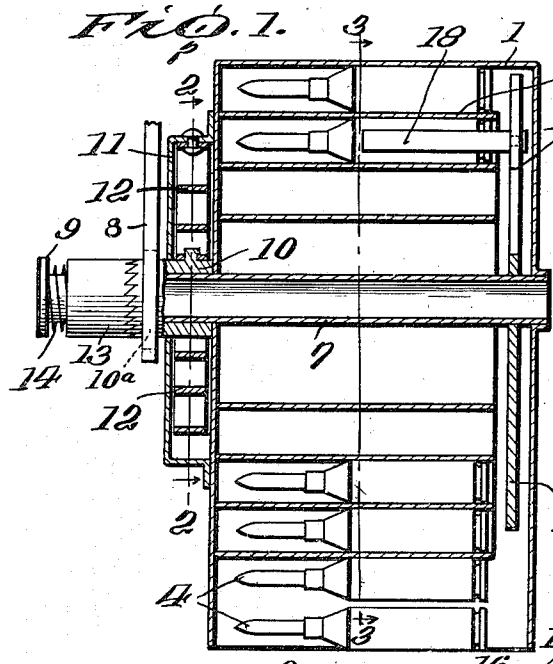


FIG. 2.

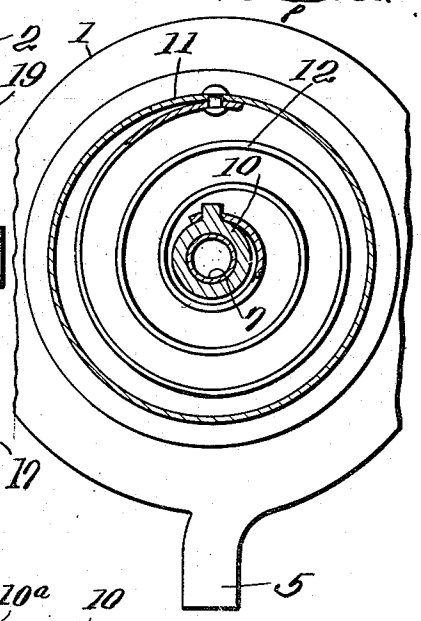


FIG. 4.

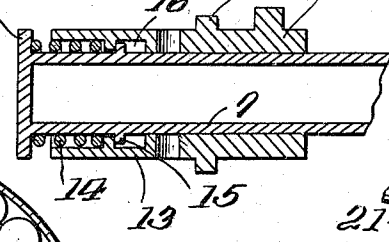


FIG. 5.

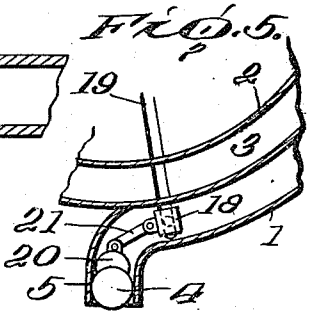


FIG. 3.

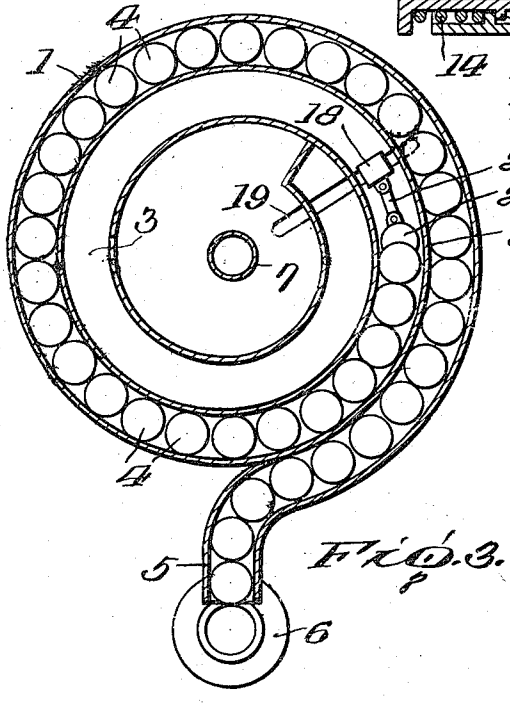
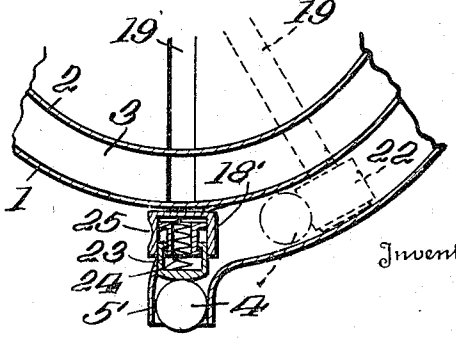


FIG. 6.



Inventor

Antoine Gazda

By E. F. Vendeuth

Attorney

Patented Feb. 12, 1946 2,394,606

UNITED STATES PATENT OFFICE

2,394,606

AUTOMATIC FEED MECHANISM FOR LOADING ORDNANCE, TOOLS, AND THE LIKE

Antoine Gazda, Providence, R. I.

Application February 17, 1943, Serial No. 476,240

2 Claims. (Cl. 89—34)

A well-known type of automatic feed mechanism, particularly useful for loading firearms with ammunition, consists essentially of a magazine adapted to be mounted on the firearm to be fed, and spring-actuated means comprising a pusher or follower adapted, under the influence of the spring, to move the ammunition through a spiral path in the magazine and discharging into the firearms. The said type of feed mechanism involves a clutch mechanism whereby the spring and follower may be connected and disconnected at will. According to this known relationship of parts, the actuating spring as well as the means whereby the spring and follower may be releasably coupled are housed within the bounds of the magazine proper so that the effective capacity of the magazine is commensurately reduced. Moreover, while it is possible to discharge all the ammunition from the magazine proper of the known mechanism, no means is provided for discharging the last two or three cartridges from the mouthpiece or ejecting slot of the magazine, and the result of this is further to reduce the effective capacity of the device.

An embodiment of automatic feed mechanism of the character above outlined is described in the applicant's copending application, Serial No. 290,291, filed August 15, 1939, for "A drum type cartridge magazine," now U. S. Patent No. 2,367,572, dated Jan. 16, 1945.

A primary object of the present invention is the obviation of the disadvantages of the prior construction of the aforedescribed type.

A further object of the invention is the provision of a novel relationship of parts wherein maximum advantage may be taken of the holding capacity of the magazine proper. To this end, briefly stated, the parts are so constructed and arranged as to remove the follower-actuating spring means as well as the means for coupling and uncoupling the said spring means and follower from within the bounds of the magazine proper.

Still another object of the invention is the provision, in a device of the character described, of means whereby complete evacuation of the magazine and discharge mouthpiece may be effected, thus making it possible actually to realize the full capacity of the magazine. To this end, a new form of articulated follower is provided which, as will hereinafter more specifically appear, enables a full and complete discharge of the magazine to be realized.

Presently preferred embodiments of the invention are shown, solely by way of example, on the accompanying sheet of drawings, and are described in the following detailed description with particular reference to a cartridge feeding device. It will be readily apparent, however, that the novel relationship of parts according to the present invention may equally well be used for the automatic feeding and discharge from a magazine of other objects than cartridges, such for example as work-pieces to be operated on by a machine or machine tool, etc.

On the said sheet of drawings:

Fig. 1 represents a longitudinal section through a magazine for automatic firearms according to the present invention, i. e., a sectional view taken axially of the device;

Fig. 2 is a sectional view taken along line 2—2 of Fig. 1;

Fig. 3 is a sectional view taken along line 3—3 of Fig. 1;

Fig. 4 is a fragmentary view, on an enlarged scale, of the means for coupling and uncoupling the spring and follower of the device;

Fig. 5 is a fragmentary sectional view, on an enlarged scale and with parts in elevation, of one form of magazine follower; and

Fig. 6 is a fragmentary sectional view, on an enlarged scale and with parts in elevation, of a second form of magazine follower according to this invention.

As shown more particularly in Figs. 1, 2 and 3, reference numeral 1 designates a magazine casing provided with a spiral ledge 2 extending from one wall thereof to a point just short of the opposite wall, thus defining a fixed spiral guiding channel 3 for the cartridges 4. Channel 3 terminates in a mouthpiece or ejecting slot 5 which cooperates with a suitable inlet on firearm 6 on which the automatic cartridge feeding device may be mounted in the usual manner.

Rotatably mounted substantially centrally of the magazine casing 1 is a hollow shaft 7 which, as shown more particularly in Fig. 1, extends on one side to a considerable distance beyond the casing and is provided with a crank 8 which is preferably removably mounted on the square enlargement 10a of sleeve 10. The latter is mounted on shaft 7 immediately exteriorly of casing 1, and itself extends through spring housing 11 which is integrally associated with casing 1. A spiral spring 12 is arranged on sleeve 10 in housing 11, one end of the spring being secured to the latter by a rivet or the like as shown, while the other end is secured to the sleeve 10.

On the one end of shaft 7 is mounted a dentated coupling sleeve 13, the toothed end of which is adapted for releasable engagement with the juxtaposed toothed end of sleeve 10. Coil spring 14 is interposed between stud end 9 and sleeve 13, as shown in Figs. 1 and 4, and normally urges the coupling parts 10 and 13 into interengagement. One or more lugs 15 provided on shaft 7 are received in corresponding recesses 16 in sleeve 13 to operatively interconnect these two parts. The recesses 16 are relatively elongated to allow relative sliding displacement of sleeve 13 upon uncoupling of the parts 10 and 13.

Mounted on shaft 7 adjacent the other end thereof and extending into the space left between the free edge of spiral ledge 2 and the magazine casing wall, is a carrier disk 17. This disk carries the magazine follower which is shown on the drawing in two embodiments. Referring first to the embodiment of Fig. 5, the follower comprises a bar-shaped magazine follower slide 18 which extends into the channel 3 and is engaged, at one end thereof, through a radial slot 19 in disk 17, as shown in Fig. 1. The follower slide 18 slides along the slot as the channel 3 is progressively charged or discharged. Bearing against the adjacent cartridge 4 is a fitted magazine follower 20, one side of which is arcuate to adapt it to the arcuate cartridge casing surface. Follower 20 is articulated to slide 18 through the medium of links 21.

When loading the magazine according to the embodiment of the invention thus described, the cartridges 4 are introduced successively into the spiral guiding channel 3 until the magazine is in the almost fully loaded position shown in Fig. 2. During this loading operation the follower 20, which was in that portion of the channel nearest the mouthpiece 5 at the beginning of the operation, is moved back away from the mouthpiece, entraining therewith and thus rotating the disk 17 and shaft 7 counter clockwise as seen in Fig. 3. Before loading the magazine, member 13 is detached from member 10 by movement against the flanged end 9 of shaft 7 in opposition to spring 14, thereby dissociating member 10 completely from shaft 7 and connected parts. After loading the magazine, member 10 is turned by means of the crank 8 to tension the spring 12, whereupon, upon restoring member 13 to coupling relationship with member 10, the device is ready to operate. The tensioned spiral spring 12 acts on the composite follower member 18, 20, 21 through the medium of coupling 10, 13, shaft 7 and disk 17, thus moving the cartridges toward the outlet of the guiding channel 3. The articulated and therefore flexible character of the composite follower member makes it possible, as shown in Fig. 5, to discharge all the cartridges from the magazine, notwithstanding the sharp change in the direction of movement due to the disposition of the mouthpiece.

An alternative embodiment of the follower construction is illustrated in Fig. 6 of the drawing. Here, an intermediate portion of the follower slide 18' is recessed to provide a housing 22 for a collapsible cup-shaped pusher 23 which is normally retained therein against the pressure of the pusher spring 24, as shown in broken lines in Fig. 6. In this form of the invention, the slide member is shaped at its leading surface 25 to adapt it to the shape of the cartridge being pushed. As the pusher reaches its end position, the leading portion thereof enters into a recess 26 provided in the mouthpiece 5', and the collapsible pusher 23 is then slid outwardly to the position shown in full lines in Fig. 6, thereby ejecting all the cartridges. Means (not shown) may be provided for preventing removal of the pusher 23 from the slide 18'. In other respects, the parts are as hereinbefore described.

It is apparent that, by the relationships of parts above described, the objects of the present invention are fully realized and that the interior of the magazine proper is substantially entirely available for the reception of cartridges—the clutch and spring mechanisms being situated on the exterior thereof—and that the contents of the magazine may be fully discharged down to the very last cartridge. It is manifestly a significant advantage to be able, without changing the size of the magazine proper, to make available for the automatic firearm to which it is fitted a considerably increased quantity of ammunition.

While the invention has above been described with particular reference to the automatic feeding of cartridges to a gun, it is apparent that the identical relationships of parts may be employed for automatically feeding other items to other associated devices, for example, metal billets to machines for operating thereon, etc.

The invention is not to be limited to the details above described by way of illustration, and it is manifest that various changes may be made therein without departing from the spirit and scope of the invention. Thus, for instance, in the embodiment of Fig. 6, spring 24 may be omitted and pusher 23 may be operated by the action of gravity.

Having thus described the invention, what is claimed is:

1. Drum type means for automatically feeding a plurality of articles, comprising a casing defining a magazine proper for said articles, means in said magazine proper defining a guiding channel for said articles, a delivery mouthpiece in which said channel terminates, a multi-part magazine follower operating in said channel and having a part thereof in abutting relationship with one of said articles, a follower actuating disk within said casing arranged in juxtaposition to but exteriorly of said magazine proper, said disk being operatively connected with said follower, a rotatable shaft extending substantially centrally through said casing and projecting therebeyond at the side thereof remote from said disk, said disk being integrally associated with said shaft, a spring positioned exteriorly of said casing about said shaft for placing said disk and follower under tension, whereby said follower is urged against said articles toward said delivery mouthpiece, a sleeve interposed between said spring and shaft and being operatively integrated with the former and rotatable with respect to the latter, and means comprising a slidable coupling sleeve arranged for relative sliding movement on said shaft exteriorly of said spring and engageable with and disengageable from said first-named sleeve for connecting and disconnecting said spring and follower, and means interconnecting said coupling sleeve and shaft for conjoint rotation.

2. Drum type means for automatically feeding a plurality of articles, comprising a casing defining a magazine proper for said articles, means in said magazine proper defining a guiding channel for said articles, a delivery mouthpiece in which said channel terminates and arranged at a substantial angle relative to said channel, a multi-part magazine follower operating in said

channel and having a part thereof in abutting relationship with one of said articles, a follower actuating disk within said casing arranged in juxtaposition to but exteriorly of said magazine proper, said disk being operatively connected with said follower, said disk and follower constituting means for moving and ejecting all said articles from said mouthpiece and said article-abutting part including a plurality of interconnected and mutually relatively movable elements, at least one of such elements being in the said abutting relationship with the last article when the latter is discharged from said mouthpiece, a rotatable shaft extending substantially centrally through said casing and projecting therebeyond at the side thereof remote from said disk, said disk being integrally associated with said shaft, a spring positioned exteriorly of said casing about said shaft for placing said disk and follower under tension, whereby said follower is urged against said articles toward said delivery mouthpiece, a sleeve interposed between said spring and shaft and being operatively integrated with the former and rotatable with respect to the latter, and means comprising a slidable coupling sleeve arranged for relative sliding movement on said shaft exteriorly of said spring and engageable with an disengageable from said first-named sleeve for connecting and disconnecting said spring and follower, and means interconnecting said coupling sleeve and shaft for conjoint rotation.

ANTOINE GAZDA.