Aug. 5, 1947. V. C. BOWSER 2,424,964

AMMUNITION POSITIONING DEVICE FOR GUNS

Filed May 31, 1945 3 Sheets-Sheet 1

FIG. 8

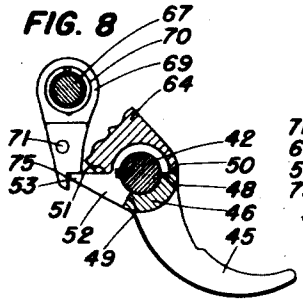


FIG. 7

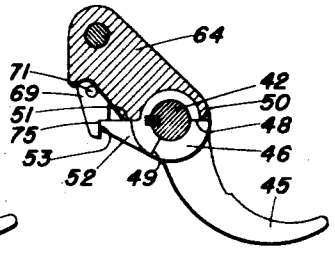


FIG. 1

INVENTOR
VIRGIL C. BOWSER

BY

ATTORNEY

Aug. 5, 1947. V. C. BOWSER 2,424,964

AMMUNITION POSITIONING DEVICE FOR GUNS

Filed May 31, 1945 3 Sheets-Sheet 2

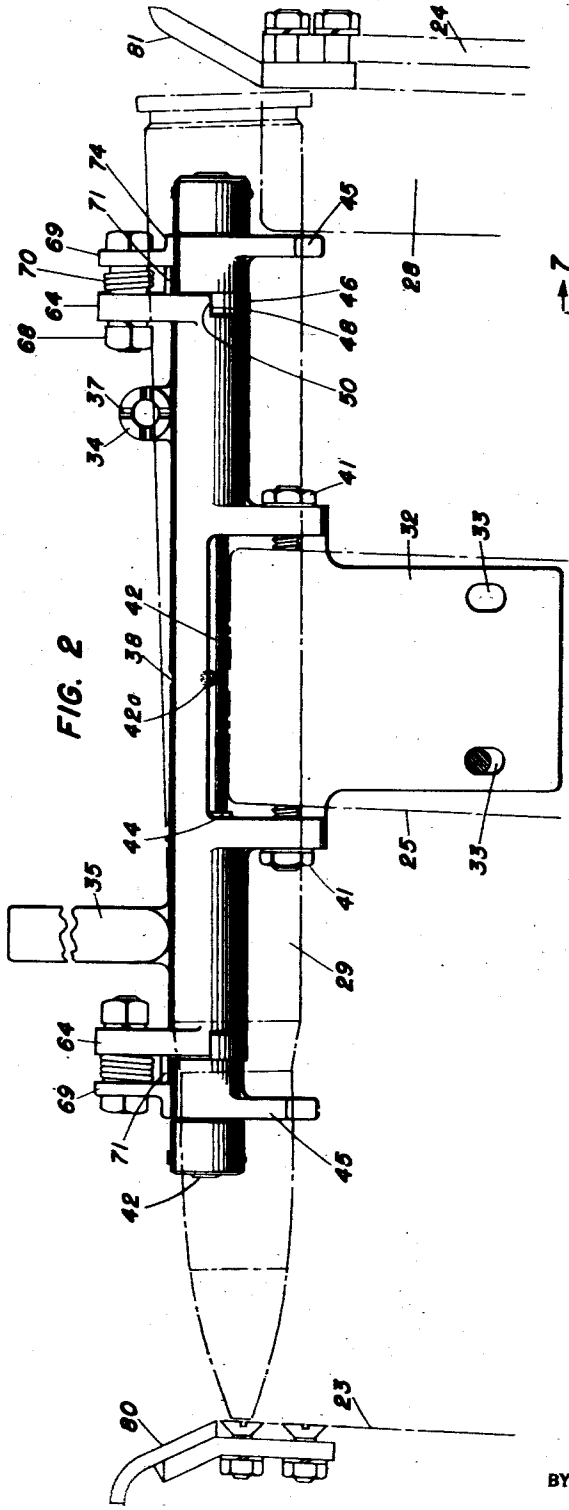


FIG. 2

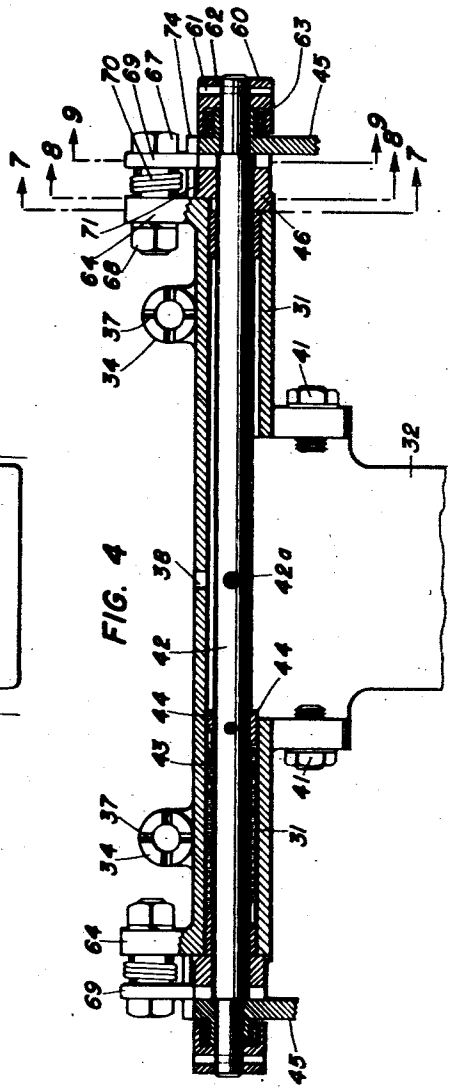


FIG. 4

INVENTOR
VIRGIL C. BOWSER

BY

ATTORNEY

Aug. 5, 1947. V. C. BOWSER 2,424,964

AMMUNITION POSITIONING DEVICE FOR GUNS

Filed May 31, 1945 3 Sheets-Sheet 3

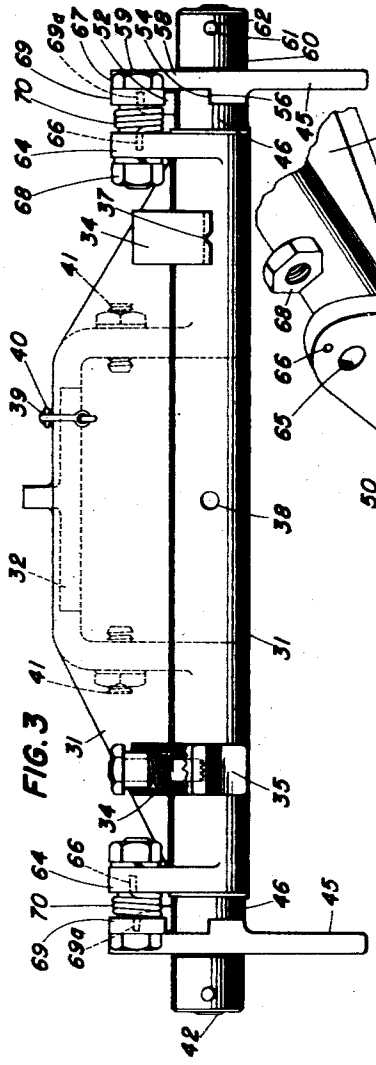


FIG. 3

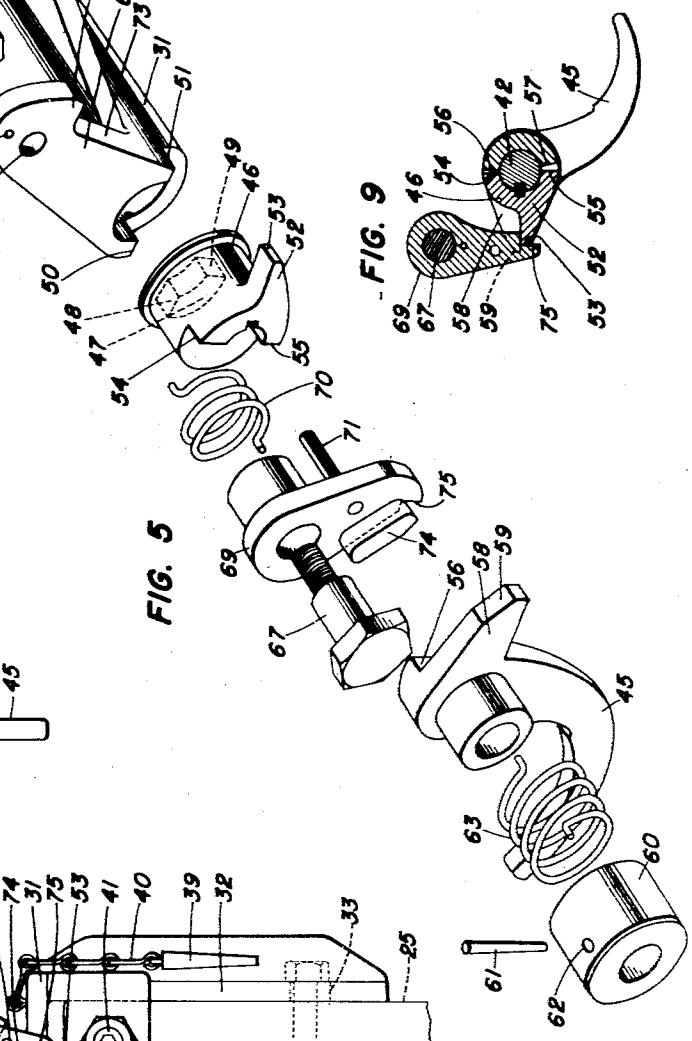


FIG. 5

FIG. 9

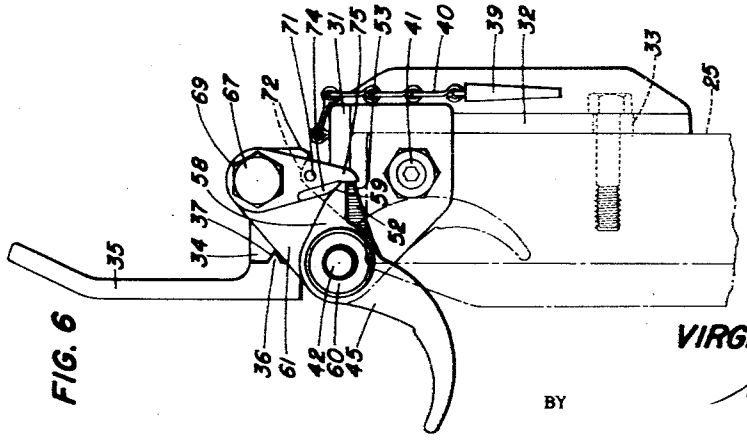


FIG. 6

INVENTOR
VIRGIL C. BOWSER

BY

ATTORNEY

Patented Aug. 5, 1947 2,424,964

UNITED STATES PATENT OFFICE

2,424,964

AMMUNITION POSITIONING DEVICE FOR GUNS

Virgil C. Bowser, Silver Spring, Md.

Application May 31, 1945, Serial No. 596,934

13 Claims. (Cl. 89—33)

(Granted under the act of March 3, 1883, as amended April 30, 1928; 370 O. G. 757)

1

This invention relates to devices for positioning articles in feedways, and more particularly to devices for positioning ammunition in the feedway of a gun.

One object of this invention is to provide a novel device for correctly positioning objects being fed into a feedway where the exact positioning of the objects in the feedway is essential to the functioning of the feed mechanism associated with the feedway.

Another object of the invention is to provide a device for assuring the correct positioning of ammunition being fed into the feedway of a machine gun. The invention has particular reference and application to 40 mm. machine guns of the "Bofors" type in which ammunition is positioned by hand between upwardly extending guides where it is engaged by feed pawls for positive movement into the breech mechanism of the gun. Prior to the present invention, the loading of ammunition into the feed guides or feedway has been a very exacting task requiring an adeptness which could be acquired only through long practice during which a considerable wastage of ammunition and man hours takes place. If the ammunition being fed into the feedway is not positioned correctly, feedway jams occur which require considerable time to clear, and which might well be fatal if they occur during action with the enemy. The present invention overcomes these difficulties by providing a simple and positive-acting positioning means which assures that the ammunition is correctly positioned before permitting the ammunition to move into the feedway of the gun.

Another object of the invention is to provide an ammunition positioning device which is simple in operation, light in weight, easily constructed, and which requires very little personnel training for its use.

These and other objects of the invention will be apparent from the following specification and the accompanying drawings, in which

Fig. 1 is a perspective view of a twin machine gun mount showing the new loading devices in position adjacent the feedways of the guns;

Fig. 2 is a side elevational view of the loading device showing a round in position in the device in chain lines;

Fig. 3 is a plan view of the loading device, a portion being shown in section;

Fig. 4 is a longitudinal sectional view of the loading device;

Fig. 5 is an exploded view of the parts of the loading device included in the right end of Fig.

2

3, the structure appearing as though viewed from the upper right corner of Fig. 3;

Fig. 6 is an end elevational view of the device showing the position of the depressed pivoted arms in chain lines; and

Figs. 7, 8 and 9 are cross sectional views taken on lines 7—7, 8—8, and 9—9, respectively, of Fig. 4.

In the drawings, Fig. 1 shows a pair of the positioning devices used in conjunction with a twin machine gun mount using "Bofors" type machine guns denoted in general by the numeral 20 and having breech mechanisms 21 above which are positioned ammunition feedways 22. Each feedway comprises a front guide 23, a rear guide 24, and left and right lateral frames 25. The lateral frames 25 contain a series of fixed stop pawls 26 and a series of movable feed pawls 27, the feed pawls being reciprocated within the frames by the breech mechanism of the gun to move the ammunition downwardly in the feedway until the ammunition comes under the control of the breech mechanism of the gun. The fixed stop pawls 26 serve to retain the rounds of ammunition against upward movement during reciprocation of the feed pawls 27. The front and rear guides 23 and 24 contain inwardly facing grooves 28 in which the noses and bases of the rounds of ammunition ride.

The rounds 29 are generally mounted in clips of four held together by a clip 30, each round being positioned at a slight angle to the adjacent round causing the noses and the bases of the rounds in a clip to lie in arcs of circles. In order to accommodate the rounds thus positioned in the clip, the front and rear guides of the ammunition feedway are curved forwardly on arcs having the same radii as the arcs of the noses and bases, respectively, of the rounds in the clips.

The ammunition is normally positioned in the feedway by dropping a clip of four rounds downwardly into the feedway so that the lowermost round is engaged by the feed pawls 27 which move the ammunition downwardly to the breech mechanism of the gun. If the gun is empty, the first clip of cartridges must be pushed downwardly into the feedway to position the first round in the breech mechanism of the gun. The clips are automatically removed from the rounds by means (not shown) in the rear guide and are ejected through a clip chute (not shown).

Due to the fact that this type of gun is a double purpose gun, being equally useful against aircraft and against surface targets, the wide range of elevations through which the gun is used causes

the position of the feedway to assume a great variety of angles, thus making it difficult for the loader of the gun to correctly position the rounds in the feedway, especially since the gun may be moving during the loading process. This difficulty is increased by rapidly operating modern gun elevating mechanisms which are necessary in order for the gun to be useful against rapidly moving aircraft. If the rounds are not correctly positioned in the feedway, they become jammed requiring considerable time and effort to remove them, and putting the gun temporarily out of action.

The mechanism which I have devised to overcome the difficulties involved in positioning the ammunition in the feedway of this type of gun comprises briefly a pair of arms mounted adjacent the entrance to the feedway and so interlocked that they can move out of the way to permit the passage of ammunition into the feedway only when a round of ammunition is positioned on both of said arms so as to depress said arms through a slight arc and disengage the interlocking means. This assures that the ammunition is correctly positioned with respect to the feedway before it can move into the the feedway as the arms define the desired attitude of rounds entering the feedway.

In the drawing, the new device comprises the supporting member or housing 31 having a downwardly extending mounting portion 32 which is adapted to be secured to the inner lateral frame 25 of the ammunition feedway by any suitable means such as by bolts extending through holes 33. A pair of screws 41 are provided in the support for securing the support against motion relative to the lateral frame to which it is attached as shown in Fig. 2. On the upper side of the housing 31 are located a pair of guide supports 34 for pivotally supporting one or more ammunition guides 35 having projections 36 to engage indentations 37 in the mounting. Each guide is resiliently urged into contact with the mounting so that the guide 35 tends to remain in the position in which it is held by the engagement of the projections 36 and the indentations 37. The guide 35 may be moved to an inoperative horizontal position by exerting pressure thereon to cause the projections 36 to move out of the indentations 37 by the camming action of the sloping surfaces thereof.

The housing is also provided with a downwardly extending hole 38 and a pin 39 connected to the housing by a chain 40 for a purpose which will be discussed presently. Upwardly extending arms 64 are formed integral with the housing 31 for a purpose which will be discussed presently.

A shaft 42 having a central diametrical hole 42a is journaled in the housing 31 and is surrounded in part by a spring 43 attached to a collar 44 keyed to the shaft. The spring is attached to the housing at its other end so as to urge the shaft in a counter-clockwise direction as viewed in Figs. 7 through 9. Rotatably mounted on each end of shaft 42 are arms 45 which cooperate with mechanisms to be described presently which prevent movement of either of the arms 45 out of the path of the ammunition independently of the other arm. As the mechanisms on each end of shaft 42 are substantial duplicates with only minor exceptions which will be brought out in the following description, the assembly cooperating with the arm mounted on the right end of the shaft as shown in Fig. 3 and shown

in the exploded view (Fig. 5) will be described in detail.

A collar 46 is keyed to the shaft 42 adjacent the end of the housing 31 and is provided on its inner end with an arcuate flange segment 47 having end surfaces 48 and 49 which cooperate with shoulders 50 and 51 respectively on the end of housing 31. As shown in Fig. 5, the shoulders 50 and 51 are positioned approximately 180 degrees apart while the faces 48 and 49 of flange segment 47 subtend a smaller arc so as to permit limited motion of collar 46 and consequently of shaft 42 relative to the housing 31. The collar 46 also carries an integral rearwardly extending latch arm 52 terminating in a shoulder 53. The outer end of the collar 46 is partially cut away to form shoulders 54 and 55 which serve a purpose to be explained presently. Ammunition positioning arm 45 is loosely mounted on the shaft adjacent the collar 46 and has shoulders 56 and 57 which are so positioned with respect to the shoulders 54 and 55 with which they cooperate that a slight relative rotational movement between the arm 45 and the collar 46 is permitted as shown in Fig. 9. The arm 45 also has an integral rearwardly extending projection 58 which is provided with an upper cam surface 59. A collar 60 is fastened to the end of the shaft 42 by means of a pin 61 which extends through a hole 62 in the collar and through a hole (not shown) in the end of the shaft. This collar serves the purpose of maintaining the other elements in place on the shaft and also engages one end of a coiled spring 63 whose other end is attached to the arm 45, and which urges arm 45 upwardly to engage the shoulder 56 with shoulder 54 on the collar 46.

The upwardly extending arm 64 integral with the housing 31 is provided with a pair of holes 65 and 66. Bolt 67 extends through hole 65 to engage nut 68 and serves the purpose of pivotally supporting a latch keeper 69 which is urged downwardly by a spring 70 having one of its ends positioned in hole 66 and the other end attached to the latch keeper 69 by insertion in a hole 69a (Fig. 3) in said latch keeper. A pin 71 mounted on the latch keeper 69 limits the rotation of the keeper by engagement with an overhanging extension 72 of the arm 64 and with the rear edge 73 of the arm 64. The keeper carries a cam member 74 for cooperation with the cam surface 59 of arm 45 for a purpose which will be explained presently. The keeper also has a notch 75 adapted to cooperate with shoulder 53 of latch 52.

The mechanisms mounted on the right end of shaft 42 as viewed in Figs. 3 and 4 are mirror duplicates of the mechanisms mounted on the left end of the shaft with the exception that the shoulders 48, 49, 50 and 51 are omitted on the left end inasmuch as the aforementioned shoulders on the right end are adequate to limit the extent of rotation of the shaft 42. With the exception of the functions performed by these shoulders, the operation of the parts on both ends of the device is the same, as will now be explained.

When the parts of the device are in their normal positions, the arms 45 extend into the feedway 22 of the gun so that the rounds must pass them in order to move into the feedway. The arms 45 are in the position shown in Fig. 9 and can move downwardly only the slight distance between shoulders 55 and shoulders 57. When a round of ammunition is placed on only one of the arms 45, the arm is permitted to move only a

short distance downwardly during which movement the cam surface 59 on the projection 58 carried by the arm engages the cam surface 74 on the corresponding latch keeper 69 and moves the keeper rearwardly a sufficient distance to disengage the keeper from the shoulder 53 on latch 52. However, neither arm 45 when depressed alone can move downwardly a sufficient distance to permit passage of the ammunition due to the fact that after its short preliminary movement, the shoulder 57 on the arm contacts shoulder 55 on the adjacent collar 46 which is unable to rotate due to the fact that it is keyed to the shaft 42. Shaft 42 is keyed to the collar 46 on the other end of the shaft which is prevented from rotating by the contact of its latch shoulder 53 with the corresponding latch keeper 69. In order for either arm 55 to be moved downwardly far enough to permit the ammunition to move into the feedway, it is necessary to depress both the arms 45 through their preliminary movements to move both the keepers 69 rearwardly and disengage them from the shoulders 53 on latches 52. When both of the arms 45 have moved through their preliminary movements and the latch keepers 69 at both ends of the device are disengaged, shaft 42 is free to rotate. The pressure exerted on arms 45 by the round is transmitted from shoulder 57 to shoulder 55 on the collar 46 at both ends of the device, thus rotating the shaft 42 as the arms 45 move downwardly until the shoulder 49 on the right hand collar 46 engages the shoulder 51 on the housing at which time rotation of the shaft is halted. In this way the shoulder 51 limits the rotation of the shaft and the arms 45.

On release of the pressure on the arms 45, the spring 43 which is attached to shaft 42 urges the shaft 42 in a counter clockwise direction as viewed in Figs. 7, 8 and 9, to rotate collar 46 back to its original position in which shoulder 48 engages shoulder 50 on the housing and the shoulder 53 engages notch 75 on the latch member. Each arm 45 is urged back to its original position relative to the adjacent collar by the spring 63 attached to it and the latch keepers reengage the latches under the influence of springs 70.

If it is desired to lock the arms 45 in the downward inoperative position shown in the chain lines of Fig. 6 in order to unload the feedway or for other reasons, the two arms are pushed downwardly to the inoperative position and the pin 39 is inserted through hole 38 in the support and through hole 42*a* in the shaft, thus locking the shaft in this position.

From the above description, it is apparent that the arms 45 cannot be moved out of the way of the ammunition until both are moved through their preliminary movements to disengage both the latch keepers 69. As long as either one of the latch keepers is engaged with the shoulder 53 of the corresponding collar 46, the shaft 42 cannot rotate and the arms 45 are maintained in their blocking positions to prevent the movement of ammunition into the feedway of the gun. This assures that ammunition cannot move into the feedway until the first round of a fresh clip of ammunition engages both arms 45 and moves them through their preliminary downward movement. Once the two arms have been moved downwardly by the lowermost round in a clip the succeeding rounds in the clip prevent sufficient upward movement of the arms to reengage the latches.

Auxiliary sloping extensions 80 and 81 may be attached to the front and rear guides 23, 24, if desired, to assist in positioning the ammunition.

As shown in Fig. 1, the new positioning device may be used on either a right or left hand gun, the two arms 45 being identical. It is, however, preferable to use the forwardmost guide support 34 to support a guide 35, so that if one of the devices is shifted from a gun of the opposite hand, it is necessary to change the position of guide 35 or if both guides are mounted on the device, the forwardmost guide is raised and the rearmost guide 35 is moved to a horizontal inoperative position as explained above.

It is to be understood that the above-described embodiment of the invention is merely a preferred embodiment thereof and that various changes may be made in the form, construction, and arrangement of the parts without departing from the spirit and scope of the invention.

While the invention is specifically described for use with a gun, it is obvious that the invention may be used to advantage in a wide variety of uses wherein it is necessary to accurately position an article being fed into a feedway.

The invention herein described may be manufactured and used by or for the Government of the United States of America for governmental purposes without the payment of any royalties thereon or therefor.

I claim:

1. A device for positioning an object with respect to a feedway into which it is to be fed, comprising a plurality of positioning elements for mounting adjacent a feedway and projectable thereinto in blocking positions with respect to said object, said elements also being movable out of such blocking positions to permit passage of said object, interlocking means operatively interconnecting said elements and restricting independent movement thereof, latching means adapted to restrain movement of all of said elements out of their blocking positions, each of said elements being capable of limited independent movement while remaining in the blocking position, and means interconnecting said elements and said latching means including releasing means actuable by conjoint actuation of all of said elements through their limited movements to permit movement of said elements out of said blocking positions, whereby all of said elements must be conjointly moved through said limited movements before any one is released for movement out of said blocking position.

2. A device for positioning an object with respect to a feedway into which it is to be fed, comprising a plurality of positioning elements for mounting adjacent a feedway and projectable thereinto in blocking positions with respect to said object, said elements being movable out of such blocking positions to permit passage of said object, interlocking means securing against substantial independent movement of said elements from said blocking positions, and means operable by pressure of said object conjointly against said elements for disengaging said interlocking means to permit movement of said elements out of said blocking positions.

3. A device for positioning an object with respect to a feedway into which it is to be fed, comprising a plurality of spaced, pivoted positioning elements for mounting adjacent a feedway and projectable thereinto in blocking positions with respect to said object and defining the desired initial attitude of said object with respect to said

feedway, interlocking means operatively interconnecting said elements and restricting independent movement thereof, latching means operatively connected with each of said elements and adapted to restrain movement of all of said elements out of their blocking positions, each of said elements being capable of limited independent movement while remaining in the blocking position, and means interconnecting said elements and said latching means including releasing means actuable by conjoint actuation of all of said elements through their limited movements to permit movement of said elements out of said blocking positions, whereby all of said elements must be conjointly moved through said limited movements before any one is released for movement out of said blocking position.

4. A device for positioning an object with respect to a feedway into which it is to be fed, comprising a rotatable shaft, a plurality of positioning elements carried by said shaft for mounting adjacent a feedway and projectable thereinto in blocking positions with respect to said object, interlocking means operatively interconnecting said elements with said shaft and restricting independent movement of said elements, each of said elements being capable of limited independent movement while remaining in the blocking position, latching means normally securing against rotation of said shaft and against movement of said elements out of said blocking positions, and means interconnecting said elements and said latching means including releasing means actuable by conjoint actuation of all of said elements through their limited movements to unlock said shaft, whereby all of said elements must be conjointly moved through said limited movements before any one is released for movement out of said blocking position.

5. A device for positioning an object with respect to a feedway into which it is to be fed, comprising a rotatable shaft, a plurality of positioning elements carried by said shaft for mounting adjacent a feedway and projectable thereinto in blocking positions with respect to said object, interlocking means operatively interconnecting said elements with said shaft and restricting independent movement of said elements, each of said elements being capable of limited independent movement while remaining in the blocking position, abutting means carried by said shaft, a second abutting means engaging said first abutting means and normally restraining rotation of said shaft, and means interconnecting said elements and one of said abutting means including releasing means actuable by conjoint actuation of all of said elements through their limited movements to release said shaft, whereby all of said elements must be conjointly moved through said limited movements before any one is released for movement out of said blocking position.

6. A device for positioning an object with respect to a feedway into which it is to be fed, comprising a rotatable shaft, a plurality of positioning elements carried by said shaft for mounting adjacent a feedway and projectable thereinto in blocking positions with respect to said object, interlocking means operatively interconnecting said elements with said shaft and restricting independent movement of said elements, each of said elements being capable of limited independent movement while remaining in the blocking position, a latch carried by said shaft, a latch keeper normally engaging said latch and securing against rotation of said shaft, and means interconnecting said elements and said latch keeper including releasing means actuable by conjoint actuation of all of said elements through their limited movements to release said shaft, whereby all of said elements must be conjointly moved through said limited movements before any one is released for movement out of said blocking position.

7. A device for positioning an object with respect to a feedway into which it is to be fed, comprising a rotatable shaft, a plurality of positioning elements carried by said shaft for mounting adjacent a feedway and projectable thereinto in blocking positions with respect to said object, interlocking means operatively interconnecting said elements with said shaft and restricting independent movement of said elements, each of said elements being capable of limited independent movement while remaining in the blocking position, a latch carried by said shaft, a latch keeper biased into latching engagement with said latch and securing against rotation of said shaft, and means interconnecting said elements and said keeper including releasing means actuable by conjoint actuation of all of said elements through their limited movements to release said shaft, whereby all of said elements must be conjointly moved through said limited movements before any one is released for movement out of said blocking position.

8. A device for positioning an object with respect to a feedway into which it is to be fed, comprising a rotatable shaft, a plurality of positioning elements carried by said shaft for mounting adjacent a feedway and projectable thereinto in blocking positions with respect to said object interlocking means operatively interconnecting said elements with said shaft and restricting independent movement of said elements, each of said elements being capable of limited independent movement while remaining in the blocking position, a plurality of latches carried by said shaft and corresponding in number to the number of said positioning elements, a corresponding number of latch keepers, each of said keepers normally engaging one of said latches, the engagement of any one of said latches with one of said keepers being operative to secure against rotation of said shaft, and means interconnecting each of said positioning elements with one of said keepers including releasing means actuable by conjoint actuation of all of said elements through their limited movements to release said shaft, whereby all of said elements must be conjointly moved through said limited movements before any one is released for movement out of said blocking position.

9. A device for positioning an object with respect to a feedway into which it is to be fed, comprising a rotatable shaft, a plurality of positioning elements carried by said shaft for mounting adjacent a feedway and projectable thereinto in blocking positions with respect to said object, interlocking means operatively interconnecting said elements with said shaft and restricting independent movement of said elements, each of said elements being capable of limited independent movement while remaining in the blocking position, a plurality of latches carried by said shaft and corresponding in number to the number of said positioning elements, a corresponding number of latch keepers, each of said keepers normally engaging one of said latches, the engagement of any one of said latches with one of said keepers being operative to secure against rotation of said shaft, and cam means opera-

tively interconnecting each of said positioning elements with one of said latch keepers and operative to release said shaft upon conjoint actuation of all of said positioning elements through said limited movements, whereby all of said elements must be conjointly moved through said limited movements before any one is released for movement out of said blocking position.

10. A device for positioning a round of ammunition with respect to the feedway of a gun into which it is to be fed, comprising a housing adapted for mounting on the gun adjacent a feedway, a shaft rotatably mounted in said housing, a plurality of ammunition positioning elements carried by said shaft and projectable into the entrance to said feedway in blocking positions with respect to said ammunition, interlocking means operatively interconnecting said elements with said shaft and restricting independent movement of said elements, each of said elements being capable of limited independent movement while remaining in the blocking position, a latch carried by said shaft, a latch keeper carried by said housing and coacting with said latch to restrain rotation of said shaft and movement of said positioning elements out of said blocking positions, and means interconnecting said positioning elements and said latch keeper including releasing means actuable by conjoint actuation of all of said elements through their limited movements to unlatch said shaft, whereby all of said positioning elements must be conjointly moved through said limited movements before any one is released for movement out of said blocking position.

11. A device for positioning a round of ammunition with respect to the feedway of a gun into which it is to be fed, comprising a housing adapted for mounting on the gun adjacent a feedway, a shaft rotatably mounted in said housing, a plurality of ammunition positioning elements carried by said shaft and projectable into the entrance to said feedway in blocking positions with respect to said ammunition, interlocking means operatively interconnecting said elements with said shaft and restricting independent movement of said elements, each of said elements being capable of limited independent movement while remaining in the blocking position, a plurality of latches carried by said shaft and corresponding in number to the number of said positioning members, a plurality of latch keepers carried by said supporting member and corresponding in number to the number of latches, each of said keepers being associated with one of said latches to restrain rotation of said shaft, and means carried by each of said positioning elements for disengaging the corresponding latch keeper upon movement of the positioning element through said limited movement, whereby all of said elements must be conjointly moved through said limited movements before any one is released for movement out of said blocking position.

12. A device for positioning a round of ammunition with respect to the feedway of a gun into which it is to be fed, comprising a housing adapted for mounting on the gun adjacent a feedway, a shaft rotatably mounted in said housing, a pair of ammunition positioning arms carried by said shaft and normally projecting into the entrance to said feedway in blocking positions with respect to ammunition to be fed into said feedway, a pair of collars keyed to the shaft, each of said collars having an integral latch arm and each of said collars having a cut away portion, a flange portion on each positioning arm engaging the cutaway portion of one of the collars to limit movement of the arm relative to the corresponding collar, each of said arms being capable of limited movement independent of the corresponding collar, a pair of latch keepers pivotally mounted on said housing and biased into engagement with said latch arms, the engagement of either keeper with the corresponding latch arm being operative to secure against rotation of said shaft and against the movement of said positioning arms out of their blocking positions, and latch keeper operating arms integral with each positioning arm for moving the corresponding latch keeper to an inoperative position upon movement of a positioning arm through its limited movement relative to the corresponding collar, whereby both of said positioning arms must be conjointly moved through said limited independent movements before either is released for movement out of said blocking position.

13. A device for positioning a round of ammunition with respect to the feedway of a gun into which it is to be fed, comprising a housing adapted for mounting on the gun adjacent a feedway, a shaft rotatably mounted in said housing, a pair of ammunition positioning arms carried by said shaft and normally projecting into the entrance to said feedway in blocking positions with respect said ammunition, a pair of collars keyed to the shaft, each of said collars having an integral latch arm, each of said collars having a cutaway portion, a flange portion on each positioning arm engaging the cutaway portion of one of the collars to limit movement of the arm relative to the corresponding collar, each of said arms being capable of limited movement independent of the corresponding collar, biasing means attached to said shaft and to said housing and urging said shaft to a position wherein said positioning arms are in said blocking positions, a pair of latch keepers pivotally mounted on said housing and biased into engagement with said latch arms, the engagement of either keeper with the corresponding latch arm being operative to secure against rotation of said shaft and against the movement of said positioning arms out of their blocking positions, and latch keeper operating arms integral with each positioning arm for moving the corresponding latch keeper to an inoperative position upon movement of a positioning arm through its limited movement relative to the corresponding collar, whereby both of said positioning arms must be conjointly moved through said limited independent movements before either is released for movement out of said blocking position.

VIRGIL C. BOWSER.