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CARTRIDGE GUIDING DEVICE

Filed April 24, 1957

FIG. 1

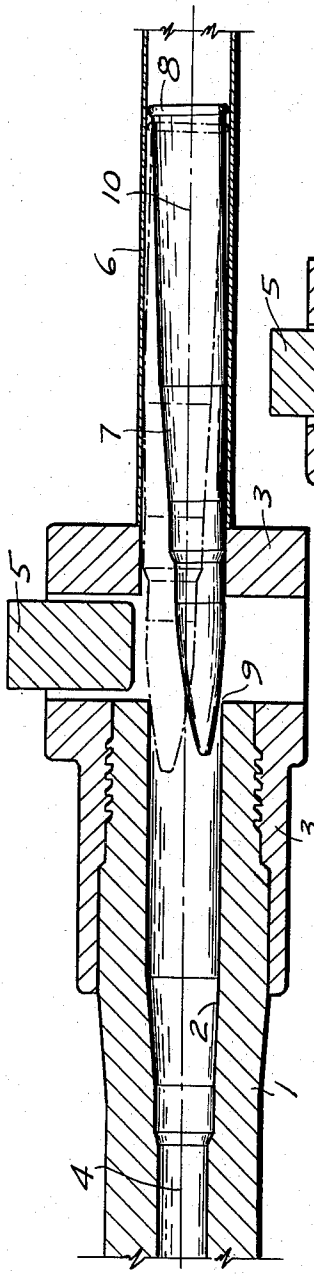


FIG. 2

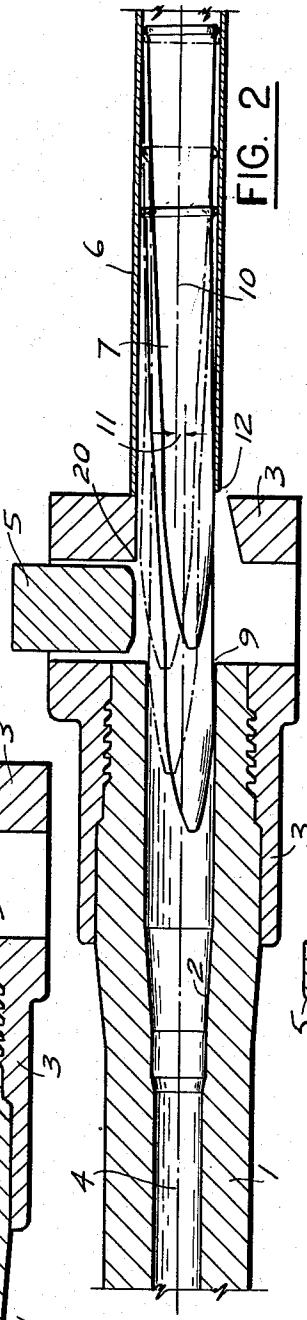


FIG. 3

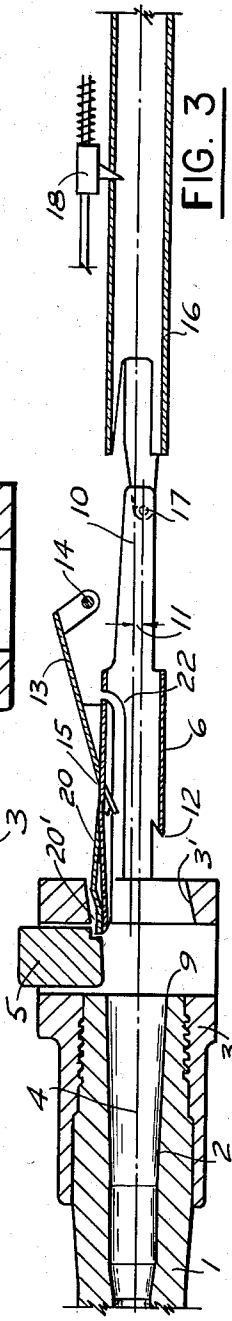
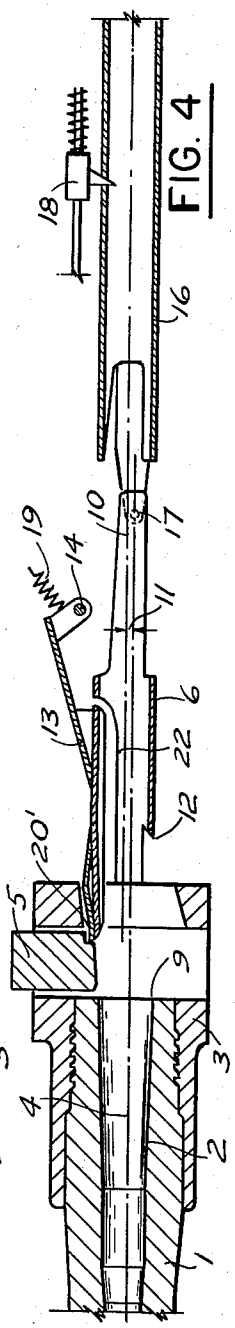


FIG. 4



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CARTRIDGE GUIDING DEVICE

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5 Claims. (Cl. 89—47)

The present invention relates to a guiding device for guiding rounds of ammunition while being rammed into the cartridge chamber of the barrel of a gun.

Modern rounds of ammunition as generally used for automatic guns and semi-automatic guns comprise a generally conical cartridge casing having at its wide end a base flange of wider diameter than said end and a generally conical projectile force fitted in the narrow end of the casing. The present invention is concerned with this kind of ammunition only.

In order to utilize the fire power of a gun especially of an automatic gun or other automatic weapon to the fullest possible extent, it is important that each round is rammed at a high and uniform speed. There are known guiding devices of the general kind above referred to, in which a round to be rammed is guided through a tubular guide member. The diameter of the guide tube is determined by the maximum diameter of the cartridge casing which, in turn, is determined by the flange at the bottom of the cartridge casing. This entails that there is considerable clearance between the guide tube wall and the main body of the cartridge casing. As a result, the forward part of the projectile of the round may strike against the rear or entrance edge of the cartridge chamber causing damage to the projectile and/or the rear or entrance edge of the cartridge chamber. Such contact between the projectile and the edge of the cartridge chamber may also impart a wobbling motion to the projectile especially during the last part of the movement of the round toward and into the cartridge chamber whereby the speed and the uniformity of the ramming motion are adversely affected.

Accordingly, the principal object of the present invention is to provide a novel and improved guiding device of the general kind above referred to, which effectively precludes a damaging contact between the round and the cartridge chamber and a wobbling motion of the round during its movement toward and into the cartridge chamber.

Another object of the invention is to provide a novel and improved guiding device in which the round while moving towards the cartridge chamber is deflected from contact with the entrance edge of said chamber to avoid damage by such contact and an adverse effect upon the speed and uniformity of the ramming operation.

Still another object of the invention is to provide a novel and improved guiding device in which the round when approaching or just entering the cartridge chamber is subject to a springy restraint thereby at last impeding wobbling of the round during the ramming operation.

Other and further objects, features and advantages of the invention will be pointed out hereinafter and set forth in the appended claims forming part of the application.

In the accompanying drawing several preferred embodiments of the invention are shown by way of illustration and not by way of limitation.

In the drawing:

Fig. 1 is a longitudinal view of a guiding device of conventional design.

Fig. 2 is a longitudinal sectional view of a guiding device according to the invention.

Fig. 3 is a longitudinal sectional view of a modification of the guiding device, and

Fig. 4 is a longitudinal sectional view of another modification and of the guiding device.

Referring first to Fig. 1 in detail, this figure shows the rear part of a gun barrel 1, including a cartridge chamber 2. The rear part of the barrel is screwed in or otherwise secured to a breech ring 3. The breech ring houses and guides a breech block 5 which is slidable transversely of the center axis 4 of the barrel. The guiding device proper comprises a tubular member 6 extending from the rear end of breech ring 3. The center axis 10 of tube 6 is coaxial with the axis of the barrel.

A round 7 is shown in full lines in tube 6. The diameter of tube 6 just fits the diameter of the base flange 8 of the cartridge casing whereby the main body of the round and especially the projectile thereof have ample clearance to wobble or oscillate within the tube about flange 8 as a fulcrum.

In the full line position of the round the projectile thereof has made contact with the lower part of the rear or entrance edge 9 of the cartridge chamber. As a result of such contact, which may be quite hard due to the speed of the ramming motion and the weight of the round, both the projectile and the edge 9 may become damaged. Furthermore, it has been found that the impact imparts to the projectile of the round a rather violent oscillating and wobbling motion which materially interferes with the uniformity of the speed of the round within the guiding tube.

Fig. 1 further shows in chain-linked lines a second position which the round may occupy when approaching or entering the cartridge chamber. In this second position the projectile has struck against the upper part of edge 9 which impact also causes the aforedescribed disadvantages. In actual practice, contact between the round and the lower part of edge 9 is the much more frequent one due to the effect of the gravity acting upon the round during its passage through tube 6.

Turning now to Fig. 2, the design of the guiding device according to this figure avoids the afore-explained disadvantages of the design of Fig. 1, as far as the much more prevalent danger of contact with the lower part of edge 9 is involved.

As is apparent, the design of Fig. 2 is basically the same as that of Fig. 1 and accordingly the same reference numerals are used to designate corresponding components, except for the crucial difference that the center axis 10 of tube 6 is moved to a higher level relative to the level of the center axis 4 of the gun barrel end and the cartridge chamber.

Fig. 2 shows in solid lines a cartridge 7 the projectile of which is just ready to enter the cartridge chamber 2 and it further shows also in solid lines a projectile which rests with its forward part upon the lower wall portion of the cartridge chamber. Due to the raising of tube 6 and the corresponding raising of the center point of flange 8 above the level of axis 4, the nose part of the projectile can no longer meet edge 9 at a damaging angle, but the projectile will slide upon the lower wall portion of the cartridge chamber at a practically zero angle. In other words, the respective wall portions of the cartridge chamber and the projectile are practically parallel to each other when they come into engagement.

Fig. 2 finally shows in chain-linked lines projectile positions in which the projectile will make or has made contact with the upper part of edge 9. While such contact is, of course, undesirable, it occurs in actual practice much less frequently than contact at the lower edge part as previously explained.

The axis 10 has been raised by a distance 11. The actual extent of this distance has to be determined for

each case. It should be such that the projectile is lifted clear of contact with the lower part of edge 9, but can still be readily rammed into the cartridge chamber.

As appears from an analysis of the several cartridge positions shown in Fig. 2, the axis of the round approximately coincides with the axis of the bore of the gun barrel during the last stage of the movement of a round into the cartridge chamber. During this last stage it is essential that the cartridge flange 8 is not so guided so that its center point is above the level of axis 4. It is further apparent from the figure that during the last stage of insertion, flange 8 will pass through the breech ring 3 and, hence, be guided by the same. In order to avoid guidance of the center point of flange 8 above the level of axis 4 during the last stage of insertion, breech ring 3 is longitudinally recessed at 3'. As a result, the flange end of the cartridge casing can drop slightly during the last stage of the insertion. The distance between the discharge edge 12 of tube 6 and the entrance edge 9 of the cartridge chamber depends upon the calibre of the round involved and is selected in accordance therewith.

If it be desired to protect the upper part of edge 9 also, in a design such as that shown in Fig. 2, this can be readily accomplished by moving the edge 20 of the breech ring slightly downward as is indicated in the dashed lines. The downward extension at the edge 20 may correspond to the distance 11. As a result, the breech ring at the edge 20 will have the same position in relation to the barrel as is shown in Fig. 1.

Fig. 3 shows a guiding device by means of which contact between the projectile of the round and the edge 9 of the cartridge casing is positively prevented at both the lower and the upper part of the edge. For this purpose the top wall of tube 6 has a longitudinal slot 22 adjacent to breech ring 3 and a cartridge deflector is fitted in said slot. The deflector comprises an arm 13 pivotally mounted on a pivot 14 and supporting a tongue shaped member 20'. The forward end of this tongue is so positioned that the flange of the casing can just pass during the last stage of the insertion and that the projectile is deflected away from contact with edge 9. To provide space for tongue 20', the breech ring is slightly recessed, and a springy plate 21 may be fitted between tongue 20' and the recessed wall 3'' of breech ring 3.

In order to avoid, or at least to restrain oscillating or wobbling motions of a round when approaching the cartridge chamber, a spring loaded nose 15 depends into tube 6 thereby slightly depressing a passing round.

The guide tube 6 is again raised by a distance 11 and the breech ring is recessed at 3' for the purpose previously described. To allow more freedom of movement of the round during the last stage of insertion, the edge 12 of tube 6 is shown withdrawn from the breech ring.

Fig. 3 further shows a loading tube 16 mounted pivotal about a pivot pin 17. The rounds are loaded into tube 16 when the same is in perpendicular position. The loading tube is thereupon returned into the illustrated position and the round is rammed home by releasing a rammer 18.

Fig. 4 shows a guiding device similar in principle to that of Fig. 3, except that nose 15 is omitted and the deflector plate 20' itself is spring-loaded by means of a spring 19.

While the invention has been described in detail with respect to certain now preferred examples and embodiments of the invention 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 as new and desired to be secured by Letters Patent is:

1. A guiding device for guiding a round of ammunition including a generally conical cartridge casing having at its wide end a base flange of a diameter wider than said casing end and a generally conical projectile fitted in the narrow end of the casing, while being rammed into a cartridge chamber in a barrel of a gun, said device comprising a generally tubular guide member having an inner diameter fitting said base flange, said guide member being mounted in communication with and forming a continuation of the cartridge chamber, said guide member having a longitudinal center axis parallel to and vertically spaced above the center axis of the cartridge chamber, said tubular member having in its top wall adjacent to the receiving edge of the cartridge chamber a deflecting member extending into the path of the projectile of a round approaching the cartridge chamber for deflecting said projectile away from the upper part of the entrance edge of the cartridge chamber to avoid contact with the said edge part.

2. A guiding device according to claim 1, wherein said deflecting member is in the form of a slanted tongue depending at the discharge end of the tubular member just below the level of the adjacent upper edge part of the cartridge chamber.

3. A guiding device for guiding a round of ammunition including a generally conical cartridge casing having at its wide end a base flange of a diameter wider than said casing end and a generally conical projectile fitted in the narrow end of the casing, while being rammed into a cartridge chamber in a barrel of a gun, said device comprising a generally tubular guide member having an inner diameter fitting said base flange, said guide member being mounted in communication with and forming a continuation of the cartridge chamber in a position in which the center axis of the guide member is parallel to and vertically spaced above the center axis of the cartridge chamber, and a yieldable deflecting means depending from the top wall of the tubular member into the path of the projectile of the round passing through the said tubular member to guide said projectile clear of the upper entrance edge part of the cartridge chamber and to steady the round during its passage through the tubular chamber.

4. A guiding device for guiding a round of ammunition including a generally conical cartridge casing having at its wide end a base flange of a diameter wider than said casing end and a generally conical projectile fitted in the narrow end of the casing, while being rammed into a cartridge chamber in a barrel of a gun, said device comprising a generally tubular guide member having an inner diameter fitting said base flange, said guide member being mounted in communication with and forming a rearwardly extending continuation of the cartridge chamber in a position in which the center axis of the guide member is parallel to and vertically spaced above the center axis of the cartridge chamber, said tubular member having adjacent to said cartridge chamber a longitudinal slot on its top part, and a yieldably mounted deflecting means extending through said slot into said tubular member to deflect the projectile of the round passing through said member out of contact with the entrance edge of the cartridge chamber and to steady the round during its passage through the guide member.

5. A guiding device according to claim 4, wherein said deflecting means comprises a wall portion fitted in said slot, mounting means pivotally supporting said wall portion, and yieldable means biasing said wall portion into the tubular member and into the path of a round passing through said tubular member.

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