

[54] FIREARM BARREL

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Related U.S. Application Data

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[58] Field of Search 42/78, 76 R

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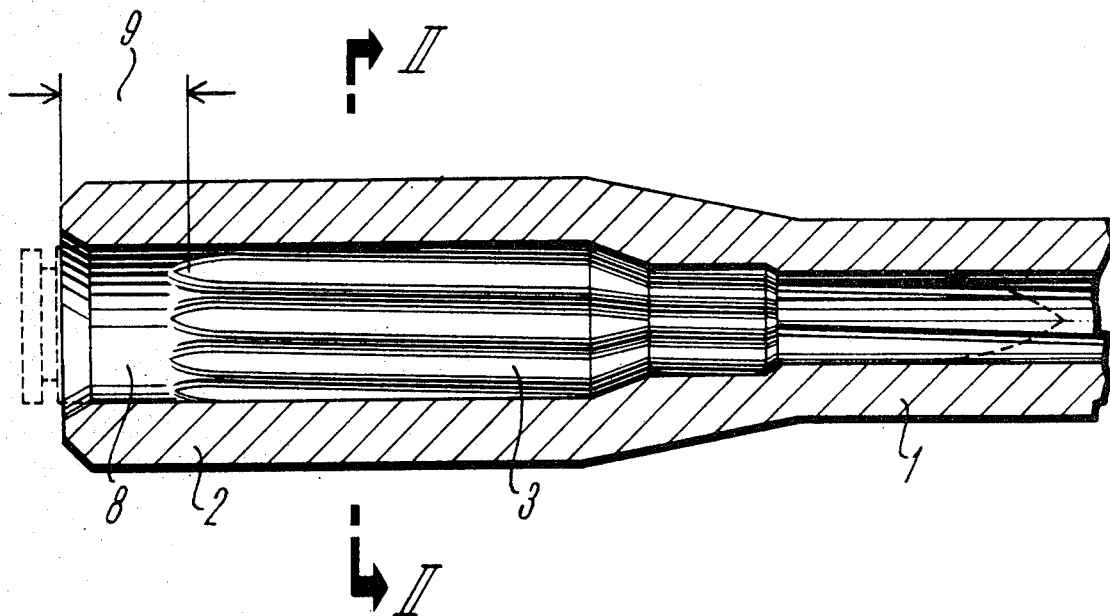
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[57]

ABSTRACT

The cartridge chamber of a firearm is provided with release grooves by virtue of polygonal shaping extending to a cylindrical sealing surface at the cap end of the cartridge. This permits simplified production as the chamber can be formed by forging at the same time that rifling of the barrel is effected.

12 Claims, 2 Drawing Figures



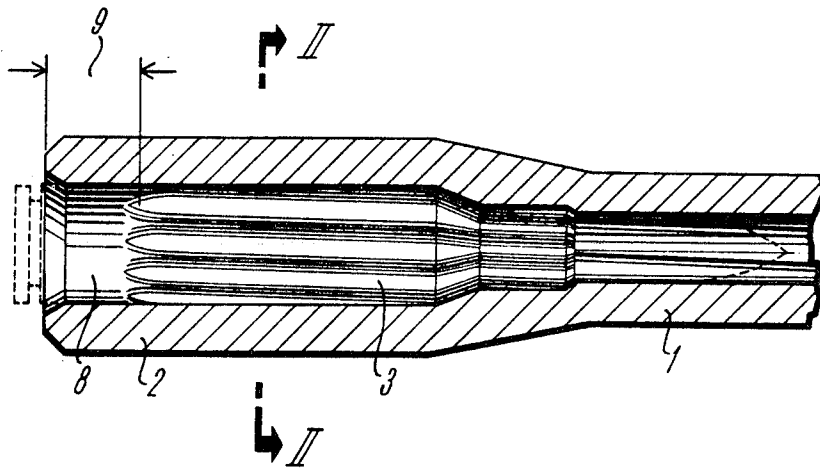


Fig. 1

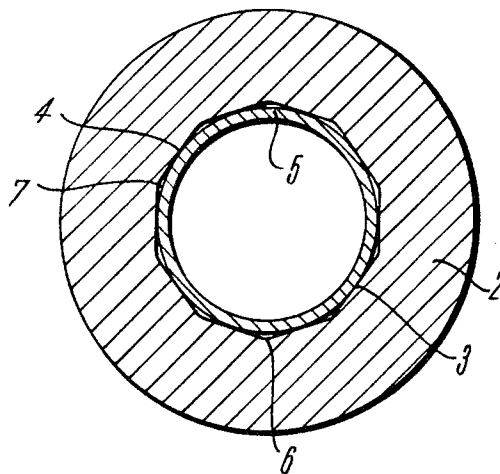


Fig. 2

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FIREARM BARREL

This application is a continuation of application Ser. No. 711,546 filed Mar. 8, 1968, and now abandoned.

The invention relates to a firearm barrel especially for hand firearms, with a cartridge chamber embodying release grooves.

The pressure developed within the cartridge case on firing a bullet tends to deform the cartridge case and therefore to press it tightly against the inner wall of the cartridge chamber. Consequently the friction between the cartridge case and the cartridge chamber is so great that with automatic firearms satisfactory extraction of the case is no longer possible in many cases. In order to avoid such retention of the case the so-called release grooves are used which are grooves cut in the wall of the cartridge chamber extending in the longitudinal direction of the chamber nearly to the base and in which a counter pressure can be developed which hinders adherence of the cartridge case to the wall of the cartridge chamber.

These release grooves have proved very effective but the production thereof is extremely difficult since they must be cut in the finished barrel. This requires the use of very fine hook-like undercutting tools which must be introduced into the narrow mouth of the barrel and by which the grooves must be cut chip by chip.

It will be understood that cutting the release grooves is very time consuming, there being a relatively large number of grooves distributed around the periphery of the cartridge chamber. Furthermore it is particularly difficult to maintain the necessary very close tolerances. These release grooves must in fact have not only a very accurate width and depth but they must commence at an exactly defined point at the forward end of the cartridge chamber, must follow the tapered rearward enlargement of the cartridge chamber and must run out shortly in advance of the rear end of the cartridge chamber in order that the sealing effect of the case shall be completely maintained at its rear end.

The invention is directed to the problem of providing a cartridge chamber having release grooves, which is much more simple to produce and moreover has favorable properties compared with the known cartridge chamber. This object is attained according to the invention by the fact that the cartridge chamber, just like the drawn part of the barrel, has approximately the form of a polygon with rounded edges as seen in section and is so proportioned that the sides of the polygon are tangential to the cartridge case.

It will be appreciated that such a cartridge chamber is much more simple to produce than a chamber which has a plurality of release grooves which must be cut individually. In particular such a cartridge chamber can be produced, in the same way as a barrel having a polygonal cross section, by means of a punch, drift or mandrel the cross section of which also corresponds to the internal cross section of the cartridge chamber. In this case all additional work for producing the release grooves is eliminated by the approximate polygonal shape of the cartridge chamber formed.

Furthermore the approximate polygonal cross section of the cartridge chamber has the further advantage that the cartridges are only in line contact with the part of the barrel surrounding the cartridge chamber. Consequently the transfer of heat between the barrel and the cartridge case is essentially reduced so that the danger of self-firing of the cartridge is minimized. It is

therefore possible with the barrel according to the invention to fire a greater number of cartridges than with a barrel of known type. The line contact between the cartridge case and the barrel is also of advantage for firing training cartridges of synthetic material since owing to the line contact the danger of a synthetic material cartridge jamming in the barrel owing to overheating is reduced. Also in this way the barrel according to the invention is preferable to the normal barrels.

In order that the sealing of the cartridge chamber shall be fully maintained even with the barrel according to the invention, in a preferred constructional embodiment of the invention the polygonal profile of the cartridge chamber merges progressively into a circular profile which commences near the outer end of the cartridge chamber. Furthermore it is convenient for the approximate polygonal profile of the cartridge chamber to have the same twist as the rifling of the barrel. In this case it is possible to forge the rifling of the barrel and the cartridge chamber in one working operation. The profile of the cartridge chamber advantageously has a greater number of corners than the barrel rifling since a greater number of release grooves distributed around the periphery of the cartridge case has a better effect. In many cases it is then convenient to choose the number of corners of the profile of the cartridge chamber so that is a simple multiple of the number of the riflings provided in the barrel.

Further details and constructions of the invention will be appreciated from the following description in which the invention is further described and explained on the basis of the constructional example shown in the drawings, and in which:

FIG. 1 is a longitudinal section through the rear part of a barrel according to the invention and

FIG. 2 is a section on the line II — II through the barrel according to FIG. 1 on a larger scale.

The barrel shown in the drawing embodies a drawn part 1 and a part 2 with the cartridge chamber 3 which is shaped in a single working operation by punching, broaching or forging on a suitably profiled mandrel. The drawn part 1 of the barrel is provided with approximately polygonal rifle grooves as proposed heretofore. The approximate polygonal profile of the drawn barrel part 1 merges progressively into the approximate polygonal profile of the cartridge chamber 3 as will be seen from FIG. 2.

As shown in FIG. 2 the cartridge chamber 3 has a cross-section approximately in the form of a decagon with rounded corners and sides so proportioned that the side parts 4 of the cartridge case 5 are tangential as shown dotted in FIG. 1. Hollow spaces 7 are thus produced in the region of the corners 6 between the wall of the cartridge chamber 3 and the outer surface of the case 5, which act as release grooves. At the rear end of the cartridge chamber are approximate polygonal profile merges, as indicated in FIG. 1, into a part 8 of the length 9 of circular cross-section which permits the cartridge to be sealed in the cartridge chamber on firing the shot in the desired manner.

The grooves formed by the rounded corners 6 of the cartridge chamber 3 have the same twist as the rifling in the barrel part 1 in the embodiment shown. Then a single mandrel, drift or punch can be used for forging the barrel, which has a portion corresponding to the cross-section of the drawn barrel with which portion corresponding to the cartridge chamber is associated.

This mandrel or the like can be withdrawn rearwardly from the barrel after finishing the barrel. For producing a smooth transition between the drawn part 1 of the barrel and the cartridge chamber 3 it is convenient if the number of corners of the profile of the cartridge chamber is a simple multiple of the rifling. Then the rifling merges into corresponding parts of the polygonal form of the cartridge chamber and it is sufficient to include further polygonal parts between these portions. Thus the barrel shown in the drawing has five rifling elements.

It will be understood that the invention is not limited to the constructional example shown but variations are possible without departing from the scope of the invention. Thus it will be understood that another shape of the cartridge chamber can be chosen according to the type of weapon for which the barrel is to be used and the selection of a different number of release grooves is possible. It is also possible to utilize cartridge chambers according to the invention for larger weapons and then the cartridge chamber may be brought to the desired polygonal form by chip removal machining, for example by broaching or grinding.

I claim:

1. In a firearm, the combination including a substantially cylindrical cartridge case and a cartridge chamber for receiving the cylindrical cartridge case, the cartridge chamber having approximately a polygonal cross-section with the corners thereof being rounded, and the approximate polygonal shape of the cartridge chamber selected so that the sides thereof are tangential to the cylindrical cartridge case received therein and whereby release grooves are formed.

2. In a firearm, the combination including a substantially cylindrical cartridge case and a cartridge chamber receiving the cylindrical case and embodying release grooves in which the cartridge chamber has substantially the shape in cross-section of a polygon with the corners thereof being rounded and portioned so that the sides thereof are tangential to the cylindrical cartridge case received therein.

3. The combination according to claim 2, wherein the approximate polygonal cross-section of the cartridge chamber merges progressively into a circular profile which commences near the outer end of the cartridge chamber so as to form a gas seal at the base of

the cartridge case.

4. In a firearm, the combination including a substantially cylindrical cartridge case and a barrel comprising a barrel part and a cartridge chamber having approximately a polygonal cross-section with the corners thereof being rounded, and the approximate polygonal shape of the cartridge chamber selected so that the sides thereof are tangential to the cylindrical cartridge case received therein and whereby release grooves are formed.

5. The combination according to claim 4, wherein the barrel part has approximately a polygonal cross-section with the corners thereof being rounded.

6. In a firearm, the combination including a substantially cylindrical cartridge case and a barrel having a drawn barrel part and a cartridge chamber receiving the cylindrical case and embodying release grooves in which the cartridge chamber has substantially the shape in cross-section of a polygon with the corners thereof being rounded and portioned so that the sides thereof are tangential to the cylindrical cartridge case received therein.

7. Barrel according to claim 6, wherein the approximate polygonal cross-section of the cartridge chamber merges progressively into a circular profile which commences near the outer end of the cartridge chamber so as to form a gas seal at the base of the cartridge case.

8. Barrel according to claim 6, wherein the drawn barrel part has the same shape as the cartridge chamber.

9. Barrel according to claim 8, wherein the barrel is provided with rifling and in which the approximate polygonal profile along the cartridge chamber has the same twist as the rifling of the barrel.

10. Barrel according to claim 9, wherein the cross-section of the cartridge chamber has a great number of corners than the rifling in the barrel.

11. Barrel according to claim 9, wherein the number of corners of the cartridge chamber cross-section is a simple multiple of the number of rifling elements provided in the barrel.

12. Barrel according to claim 8, wherein the barrel part is provided with rifling in which said rifling is of approximately polygonal cross-section.

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