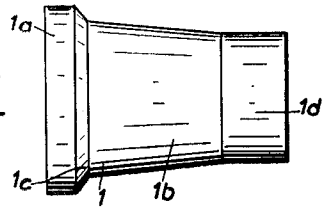
July 19, 1966 J. B. DE COURTEIX 3,261,528

CARTRIDGE CARRIER

Filed Oct. 19, 1964

Fig.1



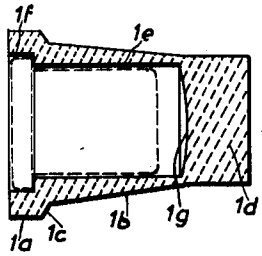


Fig.2

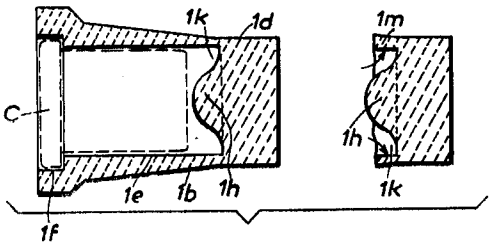


Fig.3

Fig.4

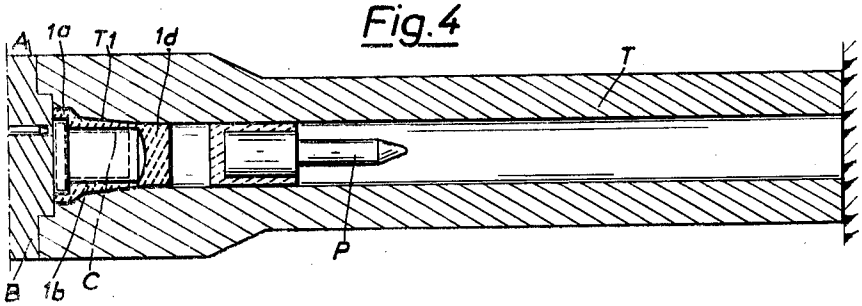
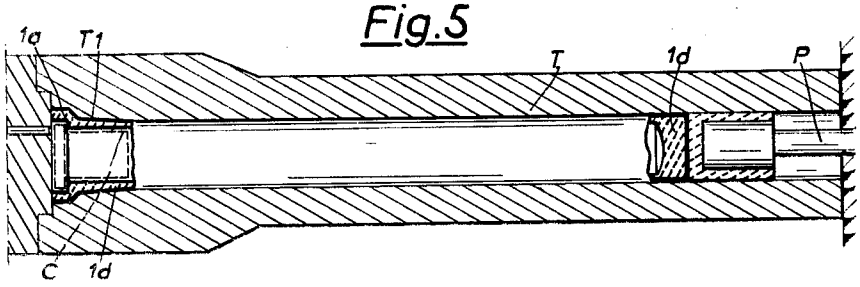


Fig.5



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CARTRIDGE CARRIER

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5 Claims. (Cl. 227—9)

The present invention relates to a cartridge carrier for receiving a cartridge for use in a gun for firing fasteners such as nails or the like.

According to the present invention, there is provided a cartridge carrier comprising a forward part, defining a cylindrical external peripheral surface, a rearward part integral with said forward part and defining an external peripheral surface which is coaxial with said cylindrical external peripheral surface, and which increases rearwardly from a diameter approximately equal to the diameter of said cylindrical surface, said rearward part having inner peripheral surface portions defining a hole therethrough co-axial with said cylindrical surface, said forward part having a rearward surface closing said hole at the forward end, said parts defining, just rearwardly of said forward part, a zone of weakness co-axial with said cylindrical external peripheral surface for causing breakage of the carrier at said zone upon explosion of a cartridge therein.

The cartridge carrier serves to contain a cartridge and is intended to be disposed in a loading chamber located at the rear end of the barrel of a gun for firing nails and the like.

It is an object of the cartridge carrier to facilitate the loading and above all the extraction of the cartridge. The cartridge carrier is advantageously made of a light material which is readily destroyed but yet is extremely economical, so that the cartridges are fitted previously into their carriers and a carrier is destroyed for each firing operation.

The cartridge carrier is made from any material which possesses a certain degree of flexibility and which is capable of fracturing under predetermined conditions, the forward part of the carrier being so shaped that it can be fitted in the barrel and that it can be separated by fracture from the rearward part during explosion of the cartridge, so as to constitute a substantially fluid-tight plug between the projectile, such as a nail, and the thrust gases.

For a better understanding of the invention, and to show how the same may be carried into effect, reference will now be made, by way of example, to the accompanying drawing, in which:

FIGURE 1 is a side elevation of a cartridge carrier,

FIGURE 2 is an axial section therethrough,

FIGURE 3 is an axial section of a modified version of the carrier, with a separate illustration of the forward part forming a plug after separation from the rearward part of the carrier, and

FIGURES 4 and 5 show a diagrammatic axial section, but to a smaller scale than that of FIGURE 2 of the cartridge carrier fitted in a loading chamber of a gun for firing nails and the like, respectively before and after the explosion of a cartridge in the carrier.

Referring to the drawing, the cartridge carrier **1** has, at its rear or striker end, an outwardly projecting flange **1***a* for fitting co-axially in a recess forming part of a loading chamber T1 disposed at the rear end of a barrel T of the gun A. The flange **1***a* is provided with a co-axial forwardly facing, frusto-conical shoulder **1***c* which serves to abut a complementary co-axial rearwardly facing shoulder of the bore of the barrel T.

Following the shoulder **1***c* is a frusto-conical external surface **1***b* which increases rearwardly in diameter. The chamber T1 is of course correspondingly shaped. These arrangements facilitate, to a considerable extent, the extraction of the cartridge carrier and the cartridge C after firing, since the cartridge carrier **1** does not lodge in the chamber T1.

The surface **1***b* is followed by a co-axial cylindrical bearing surface **1***d* the diameter of which is substantially the same as the minimum diameter of the surface **1***b* and is established with great precision having due regard to the diameter of the barrel, and taking into consideration the function of this forward part of the cartridge carrier.

The cartridge carrier is formed with a cylindrical recess **1***e* which opens rearwardly and the entrance of which is constituted by a circular chamber **1***f* which is of larger diameter than the remainder of the recess **1***e* and in which the bead of the cartridge C is lodged. The smaller diameter of the recess **1***e* corresponds to the diameter of the cartridge C, but with a slightly forced fit for retaining the cartridge. The length of the recess **1***e* is slightly greater than the length of the cartridge, so that there is a relatively small gap between the forward end of the cartridge and the closed forward end of the recess **1***c*. In this manner, the volume of the combustion chamber is diminished. The powder burns completely and instantaneously, without deflagration. The explosive thrust effect is improved.

The forward end of the recess **1***e* is located in the zone of the junction of the surfaces **1***b*, and **1***d*. It is thus in this weak zone that the wall thickness of the cartridge carrier is smallest and breakage takes place upon percussion and explosion of the cartridge.

As shown in FIGURES 2, 4 and 5, the rearward end surface **1***g* of the forward part of the carrier, which surface forms the forward end of the recess, has a slightly concave shape, so to facilitate breakage and to improve the fluid-tight qualities of the plug by imparting a certain degree of peripheral pressure.

The annular zone of weakness in which breakage occurs may be established, by preparing, during the manufacture of the cartridge carrier, for example during a moulding operation, a start of the breakage having regard to the result aimed at.

In the version of FIGURE 3, the base of the recess **1***e* is provided with an axial boss **1***h* around which is formed an annular groove **1***k*. The cartridge carrier is made such that when the cartridge explodes, a peripheral lip **1***m* remains which circumferentially bounds the groove **1***k*. The axial boss **1***h* has the effect of directing the gases against the lip **1***m* which is thus applied in a fluid-tight manner against the wall of the bore of the barrel T, whilst, however, retaining the forward pressure of the explosive thrust.

The method of use of the cartridge carrier will now be explained with reference to FIGURES 4 and 5.

The gun is loaded through the breech at the rearward end of the barrel T. The gun is of a design in which the breech block or locking block B is withdrawn or moved aside in order to free the mouth of the loading chamber T1. The projectile P, for example a nail, is then introduced into the cylindrical forward section of the bore in the barrel T, and subsequently the cartridge C and the cartridge carrier **1** are disposed together in the chamber T1. The block B is then locked, the carrier **1** being firmly held in position thereby. Upon percussion and explosion of the cartridge C, the cartridge carrier is broken at its weakest section, i.e. substantially at the level of the end face of the recess **1***e*. The forward part of the cartridge carrier is thus separated from the rearward part and accompanies the projectile P during

its displacement along the barrel (see FIGURE 5). The forward part acts as a sealing plug retaining the explosion gases at the rear of the projectile and thus causing the projectile to benefit from the full explosive thrust.

The cartridge carrier described has the following advantages:

Greater regularity and an improved thrust are obtained in the explosive effect of the cartridge, due to the fact that the latter explodes in a closed space in the cartridge carrier, and also due to the fact that, when the cartridge is fitted in the cartridge carrier, there is only a small empty space left in the carrier. The thrust effect is substantially at maximum for a given charge. The desired thrust can be obtained with cartridges having a weaker charge than normal and thus less costly than normal. The amount of space provided between the cartridge carrier and the projectile is determined in accordance with the thrust effect and the penetration which it is desired to obtain;

The cartridge carrier is made of a minimum of material, preferably a plastics material since the cartridge carrier is more economically manufactured from such a material. Two advantages are obtained one being the economy in material, and the other being the greater strength of the carrier. In fact, the relative flexibility of plastic materials would result in extrusion of the material under the explosive thrust, with the resultant disadvantages, if the thickness of the plastics carrier were relatively large, whereas the relatively small thickness provided makes the cartridge carrier extremely strong and non-deformable, since the metal walls of the loading chamber T1 to some extent reinforces the thin plastic material, thereby preventing excessive deformation. In order to illustrate this feature, with a 6.35 mm. cartridge a carrier is provided which has a thickness varying between 1.5 mm. and 0.5 mm. about the cartridge;

In consequence of the conicity of the external periphery of the cartridge carrier, and of the diminished surface offered to the rearward reaction of the explosive thrust, after the separation of the forward part the rearward part of the cartridge carrier is not subjected to any deformation which would prevent extraction or render extraction difficult;

By providing the smallest necessary empty space between the cartridge and the cartridge carrier, a cartridge carrier is obtained which is the shortest possible but which gives a plug which is as long as possible, thus improving the fluid-tightness and thrust effect on the projectile;

The manufacture from a moulded material is economical and gives high precision and excellent quality in the cartridge carrier.

I claim:

1. A cartridge holder comprising a body adapted for being inserted into a loading chamber of a gun; said body including a front part having a cylindrical external surface and a solid flat front end surface adapted for contacting a fastener disposed adjacent thereto in said barrel, and a rear part extending rearwardly from the front part and having a diverging frusto-conical surface, said rear part including a stop shoulder having a conical surface at the rearward end of said frusto-conical surface which is adapted for being retained in said loading chamber, said body having a recess opening at the rear end of the rear part and extending into the front part and defining a portion between said front and rear parts which is of minimum thickness whereby the parts will become separated at said portion upon detonation of a cartridge which is placed in said recess, said front part having a surface forming the bottom of said recess of curved shape to direct gases produced by said detonation rearwardly and outwardly.

2. A cartridge holder as claimed in claim 1, wherein said recess is cylindrical and has an enlarged circular chamber at its rearward end.

3. A cartridge holder as claimed in claim 1, wherein the surface of the front part forming the bottom of said recess is concave.

4. A cartridge holder as claimed in claim 1, wherein the surface of said front part forming the bottom of the recess includes an axial rearwardly extending boss and an encircling annular groove.

5. A cartridge holder as claimed in claim 1 comprising a cylindrical surface extending rearwardly from said conical surface of said stop shoulder.

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