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F. JANECEK ET AL
ARMOUR PIERCING PROJECTILES
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FIG. 1.

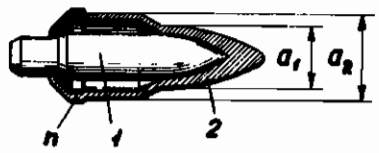


FIG. 2.

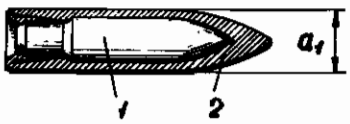


FIG. 3.

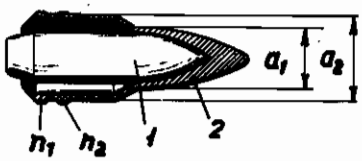


FIG. 4.

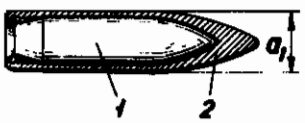


FIG. 5.

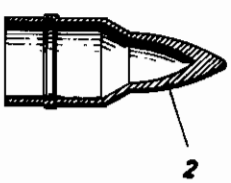
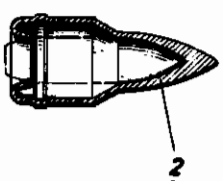


FIG. 6.



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ALIEN PROPERTY CUSTODIAN

ARMOUR PIERCING PROJECTILES

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Application filed January 10, 1939

In a prior invention of the same applicants there is described a firearm having a barrel which is provided with an addition in which the projectile, the calibre of which corresponds to the bore of the barrel, is altered to a projectile of smaller terminal calibre. The advantages of this construction are explained, which construction is particularly important for weapons of high initial velocity of the projectile, since it permits a considerable shortening of the barrel, the formation of a suitable shape of projectile, and of the charging space and a better utilisation of the explosive charge whilst retaining the shape of the end of the projectile as ballistically advantageous as with ordinary projectiles. Various alternatives of the projectile and of the corresponding added parts are also described.

The present invention relates to the armour piercing projectile which varies in the conically shaped addition to the barrel from the original calibre to the final calibre and the construction of which is further developed as compared with the description of the invention hereinbefore mentioned in such a manner that, on the one hand, the shape of the end of the projectile is substantially complete and, on the other hand, its production is as easy and cheap as possible.

In order that the invention may be clearly understood, reference may be had to the following description and accompanying drawings, by way of example, in which,

Figure 1 represents a longitudinal section through the projectile,

Figure 2 shows the same projectile also in longitudinal section after passing through the added part of the barrel,

Figures 3 and 4 show other alternatives of the projectile, Figure 3 showing this before the deformation, and Figure 4 after the deformation, and

Figures 5 and 6 indicate a process in the production of the projectile.

In Figure 1, 1 is the piercing core of the projectile, which core is retracted in its rear part to a smaller diameter, and the retraction is carried out with a cone-shaped transition. The core consists preferably of tough steel and is hardened. The jacket of the projectile 2 consists of material adapted to be shaped, e. g., soft iron, brass, "alpakka" (nickel silver), copper or the like. It forms at the front part an ogive, which corresponds to the terminal calibre of the projectile, then merges in conical form into the cylindrical guiding portion having the diameter a_2 corresponding to the initial calibre and the bore of the barrel. The forcing band n is at the end of this cylindrical portion of the jacket and serves, on the one hand, for the sealing and, on the other hand, for guiding the projectile in the rifling of the barrel. The forcing band is consequently preferably shifted quite to the end of the projectile, so that the cylindrical portion of the jacket is not exposed to the external excess pressure of the gases and is not deformed by this pressure. The end of the jacket is flanged over and pressed firmly against the cone-shaped transition, into the retracted part of the core 1.

When the projectile passes through the barrel bored over the whole length to the initial calibre a_2 and provided with rifling grooves and already attains practically the maximum velocity, it penetrates into the addition on the barrel, in the conically shaped transition portion of which its jacket is compressed into the terminal shape of the calibre a_1, as shown in Figure 2.

It is important for the correct and exact flight of the projectile that its rear part is quite smooth and perpendicular to its longitudinal axis. This is attained by the margin at the rear part of the projectile which forms a reinforcement of the jacket part and even before the placing of the projectile in the barrel is made with a smaller diameter than the end calibre of the projectile, so that on the passage of the projectile through the added part it is not deformed but remains straight and perpendicular to the axis of the projectile.

The retracted part of the core is advantageously made so long that the rear part of the projectile is, after the deformation and stretching of the jacket, filled up by the core, as shown by Figure 2. In this way, there is attained a sufficient cross-sectional loading of the projectile and also an increase of the proportional weight of the core, and thus an increase of the effect on the armour.

In Figure 3 is shown another alternative of the armour piercing projectile before the deformation, and in Figure 4 the same projectile after the deformation. With this projectile, the core is not retracted to a smaller diameter but is terminated conically. This projectile is suitable in particular for larger calibres or smaller differences in its initial and terminal calibre, where the stretching or extension of the jacket is comparatively smaller, so that the rear part of the projectile is sufficiently filled up without retraction of the core. With the projectile according to Figure 3, the forcing band is subdivided into two parts n_1 and n_2, of which one is arranged

quite at the end of the jacket, so that it prevents the penetration of the gases of great pressure on to the cylindrical guiding part of the jacket. By the arrangement of two forcing bands, there is attained on the one hand a better sealing of the projectile and on the other hand, a longer bearing of the projectile in the neck of the cartridge.

The process of making the projectile is shown in Figures 5 and 6. The projectile jacket is pressed into the shape shown in Figure 5. The forcing band can with advantage be pressed out from the jacket, as shown in Figure 5. The end of the jacket is then bent over and an edge is formed on it, the inner diameter of which exactly corresponds to the diameter of the core, as shown in Figure 6. The edge forms on the one hand a reinforcement of the bend of the jacket, and on the other hand the jacket core is thereby exactly centered in the making. After the insertion of the core in the jacket, the edge is bent over and firmly pressed against the conical part of the core until the core and jacket are firmly connected together and the hollow space in the projectile is sufficiently tight. With larger projectiles, the edge on the jacket may also be turned out (according to Figure 6).

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