Oct. 8, 1929. P. R. ARONSON 1,730,871

PROJECTILE

Filed July 17, 1924

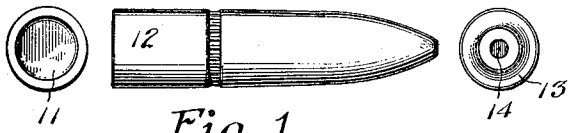


Fig. 1

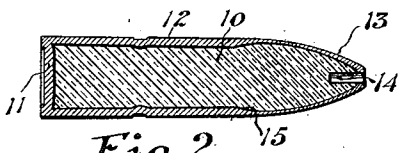


Fig. 2

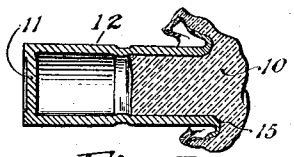


Fig. 3

Inventor

Peter R. Aronson

By A. A. Hicks and A. F. Greene Attorneys

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UNITED STATES PATENT OFFICE

PETER R. ARONSON, OF BRIDGEPORT, CONNECTICUT, ASSIGNOR TO REMINGTON ARMS COMPANY, INC., A CORPORATION OF DELAWARE

PROJECTILE

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This invention relates to projectiles and more particularly to projectiles of the type known as mushrooming projectiles.

Prior to the development of modern high velocity cartridges, following the advent of smokeless powder, small arms projectiles were quite uniformly made of lead. The lead bullet fired at a comparatively low velocity, say 1200 feet per second or under, upon striking a target is deformed from a comparatively long cylindrical shape to a flattened mushroom or disk shape, and in this shape it penetrates the target. A bullet which is thus deformed is much more destructive to animal tissue than a bullet which retains its original smooth, pointed, cylindrical shape. With the introduction of smokeless powder and the attainment of higher velocities the use of lead bullets became impossible, since a lead bullet was stripped by its engagement with the rifling of the gun in place of being given the proper rotary motion by the rifling. This resulted in rapid fouling of the gun barrel and in inaccuracy in the flight of the bullet on account of the absence of proper rotary motion. When the defect of stripping the bullet and fouling the gun barrel was remedied by providing bullets with a jacket of harder material, these bullets were not deformed on striking the target but penetrated the target retaining their original shape, and caused much less damage than bullets which were deformed on impact, and subsequently penetrate the target in the form of an irregular mass of much greater diameter than the original bullet. Numerous expedients have been resorted to as means for causing jacketed bullets to be properly deformed or mushroomed on impact with the target. However, as the range of velocities of rifle bullets has been increased, the problem has presented more and more difficulties, since a bullet which will mushroom properly at a certain velocity, say 2500 feet per second, will utterly fail at velocities appreciably above or below the given velocity. If such a bullet is fired, say at a velocity of 3000 feet per second, it virtually explodes on impact with the target, that is, the jacket material is torn to pieces, the core material is scattered and the bullet fails to penetrate the target. On the other hand, if such a bullet be fired, say at a velocity of 2000 feet per second, the diminished force of its impact with the target will fail to mushroom it altogether and the bullet will penetrate the target retaining practically its original shape.

One object of the present invention is to provide a method of controlling mushrooming which is readily susceptible of varying the characteristics of bullets to give the same the proper mushrooming qualities at greatly varying velocities.

A further object of the invention is to provide a method of controlling the mushrooming of bullets which comprises making a part of the jacket of a thickness varying as a function of the velocity at which the bullet is to be fired.

A further object of the invention is to provide a bullet jacket of one piece of metal substantially covering the core and comprising a forward or point section of reduced thickness.

A further object of the invention is to provide a bullet in which mushrooming is controlled by the combined action of a hollow point and a jacket having a certain section which is weakened by reducing the thickness thereof.

In the drawings, Fig. 1 shows a side view, a base view and a point view of a bullet comprising my invention. Figure 2 is a center section of a bullet comprising my invention. Figure 3 is a center section of such a bullet after being deformed by impact with the target.

The bullet comprises a core of a relatively soft metal, such as lead or lead alloys, surrounded by a jacket of a relatively harder metal, such as cupro-nickel or other copper alloys. Said jacket comprises a base 11, a body cover 12, and a point cover 13, said parts 11, 12, and 13 being integral. The body cover 12 is of such a thickness as to substantially resist deformation upon impact with the target. The point cover 13 is of reduced thickness, whereby it is deformed on impact with the target, the shoulder 15 at the junc-

tion of the point cover 13 and the body cover 12 serving to limit the deformation of the jacket upon impact as clearly illustrated in Fig. 3. The jacket substantially covers the bullet but a small opening is left at the point and a recess 14 in the core metal may be provided in alignment with this opening. This hollow point structure probably serves to initiate the rupture of the point cover necessary for effective mushrooming.

I have found that with a bullet of a type herein described, proper mushrooming for greatly varying velocities can be secured by varying the thickness of the point cover 13. For higher velocities a greater thickness of metal is required to resist complete disintegration of said point cover and consequent scattering of the core metal. For lower velocities a comparatively thin point cover is necessary in order that the lessened force of impact may effect proper mushrooming, and thus prevent the bullet from entering the target without being deformed at all.

I am aware that mushrooming bullets having a point cover separate from and thinner than the body cover have been used in the past but it is obvious that mushrooming of such bullets is effected in an entirely different manner from the mushrooming of the bullet forming the subject of this invention. In such bullets, the separate point cover is spread from its base when its velocity with respect to the body of the bullet is suddenly reduced upon impact with the target. The wedging action of the body cover initiates the expansion, which is completed by the forward flow of the soft core metal. The deformed tip cover as a whole still forms the front of the advancing deformed bullet. On the other hand, in my improved bullet the tip cover 13 is ruptured from the point, this action probably being initiated or assisted by the hole at the tip. The tip cover turns backward as shown in Fig. 3, and the core metal forms the front of the deformed bullet.

As I believe myself to be the first to control the mushrooming of bullets for varying velocities by varying the thickness of the point cover, I do not limit myself to the details of the bullet herein described and illustrated in the drawings, but intend that my invention shall be construed as covering all equivalent devices falling within the scope of the appended claims.

I claim:

1. A projectile comprising a core of a soft metal and a one piece jacket of harder metal substantially covering the core and comprising a relatively thick body section and a relatively thin point section, a small aperture in the jacket metal at the point of said jacket and a recess in the core aligned with said aperture.

2. A projectile comprising a core of soft metal and a one piece bullet jacket, adapted to substantially cover the core, said jacket comprising a relatively thick body section, said body section being of substantially uniform thickness, a relatively thin point section, and a small aperture in the jacket metal at the tip thereof.

PETER R. ARONSON.