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FIREARM MUZZLE ATTACHMENT AND PROJECTILE WITH EXPANSIBLE, DETACHABLE HUSK

Filed Jan. 10, 1962

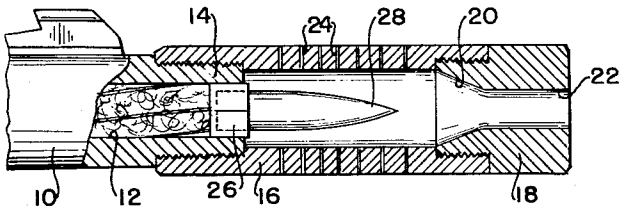


FIG. 2

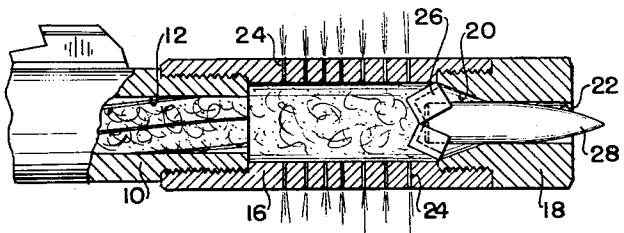


FIG. 3

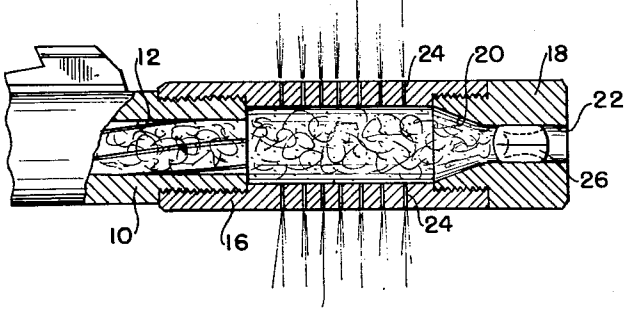
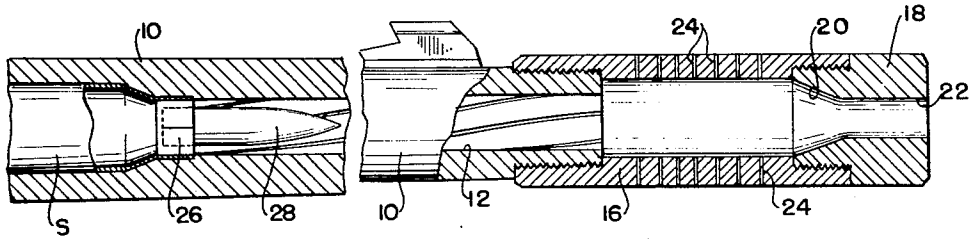


FIG. 4



FIG. 1



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FIREARM MUZZLE ATTACHMENT AND PROJECTILE WITH EXPANSIBLE, DETACHABLE HUSK

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This invention is for a novel combination generally characterized as a firing piece, as for example, a rifle, which is particularly adapted to the firing of a husk bullet and husk shot.

Another object of the invention involves novel methods of projecting such bullets with a view to increasing the range, accuracy and recoil reduction of the firing piece.

As is well understood in the art of firearms, the inertia of the bullet or projectile at the moment of firing sets up enormous stresses in the bullet or projectile which cause it to try to move off to one side or the other of the axis of the bore of the weapon and to turn so as to cause it to wobble or yaw as it moves down the bore and issues from it.

Since the conventional bullet is made relatively soft and ductile so that it will properly engage the rifling of the barrel of the firing piece, these enormous stresses also cause it to become deformed and imbalanced. Upon its exit from the bore of the firing piece the bullet retains these distortions or wobbling and cocked conditions, causing a resultant undesirable inaccuracy at range.

These various undesired conditions and effects are increased the shorter the bearing surface of the projectile in relation to its overall length.

An important object of this invention is to provide either a permanent or removable attachment for the barrel muzzle of a rifle, for example, which guides the bullet back onto the axis of the rifle bore after its exit therefrom and separation from its husk.

Additional objects include reduced weight of husk due to reduced length; increased ductibility of husk due to decreased bulk; reduced bearing surface of the bullet proper in relation to its overall length due to the virtual elimination of acceleration at the muzzle; and increased versatility of attachment due to displaceable guide nose pieces.

A further object is to provide such an attachment which in combination with a husk bullet wlil greatly reduce the recoil of the gun.

Still another object of the invention is to provide such an attachment which in combination with a husk bullet will serve to protect the projectile proper from the disturbances normally caused by the trailing cloud of gases at the time of the issuance of the bullet proper from the gun and its attachment.

A further object of this invention is to provide such an attachment which permits of the use of husk bullets having a relatively shorter bearing surface of the husk, in relation to their overall length while avoiding the inaccuracies resulting from imbalance, wobbling and cocking of the bullet proper generated during its period of acceleration.

Other objects of this invention include novel methods of accelerating and projecting bullets under conditions of extreme accuracy.

Still another object is to provide novel methods of obtaining maximum recoil neutralization.

Other and more detailed objects of the invention will be apparent from the following description of the embodiment of the invention illustrated in the accompanying drawings.

In the drawings,

FIGURE 1 is a vertical, central, cross-sectional view through a portion of a husk bullet cartridge positioned in the firing chamber of a rifle to which the anti-recoil and guiding attachment of this invention has been applied;

FIGURE 2 is a similar view of the muzzle and of the barrel showing the husk bullet about to emerge from it;

FIGURE 3 is a similar view showing successive stages of the firing and illustrating the separation of the bullet proper from the husk; and

FIGURE 4 is a similar view showing a still later stage in the operation of the device, namely just after the bullet proper has issued from the attachment but with the husk still in the attachment and momentarily trapping the gases behind it.

The subject matter of this invention has its prime utility in connection with the firing of husk bullets. Such a bullet is illustrated in one form in the drawings attached hereto.

As illustrated in FIG. 1, the barrel 10 of a rifle, for example, is provided with a suitably rifled bore 12, which communicates with the firing chamber.

The husk bullet consists of a short cylindrical soft metal cup 26 which is secured around the trailing edge of the projectile proper 28. This projectile will be made of any of the materials usually available for this purpose, and can, of course, include pellet shot such as used in shot guns. The cup 26 can be made in various forms, but as illustrated, is of cylindrical form and longitudinally split on opposite sides from its open end to and adjacent its closed end, as is clear from FIG. 3. This cup is crimped, cemented, or otherwise attached to the projectile proper so as to form a unitary assembly prior to firing.

As is clear from FIG. 2, the external diameter of the cup is properly adjusted to the bore of the rifle to form the usual fit, while the projectile proper 28 is of lesser diameter and can have different forms, as for example a long point or a short point, as illustrated. The length of the cup 26, as will appear later, can be considerably shorter than would be required in the normal case to prevent wobble, turning, yawing, and the like. The shell proper S, see FIG. 1, is of course provided with the usual explosive contents and firing cap, not shown.

In the form illustrated the terminal end 14 of the barrel 10 is shown of reduced external diameter and provided with external threads by means of which the sleeve 16 of the recoil and guiding attachment is secured thereto by complementary internal threads. In turn, the end of the sleeve 16 is internally threaded to receive a core or nose piece 18 by means of complementary threads, as shown. The core 18 is provided with a cylindrical passage, the axis of which lies on the axis of the bore of the barrel. This passage consists of a truncated conical section 20 and a concentric cylindrical guide bore section 22. The diameter of the guide bore section 22 is less than the diameter of the bore of the barrel and is preferably related in its diameter to the diameter of the projectile 28 so as to provide a light press fit therewith. The diameter of the entrance end of the conical portion 20 is equal to the internal diameter of the sleeve 16, so as to form a simple transition point therewith for a purpose to be explained later. The cylindrical guide bore section 22 of the nose piece preferably has a length about equal to the length of the bearing surface of the bullet proper 28.

The sleeve 16 is provided with a series of radial passages 24 which provide escape ports for the explosive gases. These passages may be of various forms such as cylindrical apertures, slots, and the like, and they may be distributed in various patterns circumferentially around the sleeve 16. These ports 24 correspond to the similar type of ports now widely used in various forms of gun chokes, recoil eliminators, muzzle brakes and the like, and, of course, as is sometimes done, they may be made adjustable in the discharge area.

When a firing piece in accordance with this invention is fired the explosive in the cartridge casing is activated in the usual manner, generating tremendous gas pressure behind the husk **26** containing the projectile **28**. The husk bullet is therefore rapidly accelerated down the barrel **10** in the usual manner and moves into the casing formed by the sleeve **16** and the core **18** to a condition illustrated in FIG. 3. As soon as the husk bullet is released from the discharge end of the barrel **10**, the husk **26** opens up under the forces attendant at high velocity, separates substantially from the projectile **28**, and slides along the interior surface of the passage in the sleeve **16** until it engages the entrance end of the conical portion **20**, as illustrated in FIG. 3. This causes the husk to be relatively decelerated with respect to the projectile **28**, so that the projectile progresses onwardly as an independent piece into the passage **22**. This passage being accurately positioned on the axis of the barrel and having a light press fit with the projectile **28** steadies it, taking away from it any wobbling or off course movement that it may have.

At the same time the decelerated husk **26** blocks the movement of the explosive gases issuing from the barrel behind it sufficiently to increase their pressure. These gases therefore tend to discharge through the ports **24** at an increased velocity which discharge continues and is aided when the condition illustrated in FIG. 4 is reached where the husk has been forced into the guide bore **22** and further tends to block the escape of the gases except through the ports **24**. It will be apparent, therefore, that the minimum of recoil afforded by this device is enhanced by the momentary forward deceleration of the rapidly moving explosive gases and their resultant increased velocity discharge laterally through the ports **24**.

Going back it will be seen that as the expanded husk **26** reaches the tapered passage **20** it will be gradually contracted or closed back to its original condition. In addition it will be compressed as the force of the gases drives it through the guide bore passage **22**. The husk being hollow and of soft, deformable, ductile material such as copper, for example, can be squeezed or contracted sufficiently so that it will be forced through the guide bore passage **22** and ejected behind the projectile **28**. During the period of compression and ejection of the husk the explosive gases will be relatively impeded in their forward motion, thereby increasing their tendency, as previously explained, to being ejected at even higher velocities through the ports **24**.

FIG. 4 illustrates another advantage of utilitarian feature of the subject matter of this invention; as is well known in this art the explosive gases which surround the trailing edge of the projectile at the moment of issue from the barrel tend to engulf and disturb the flight of the projectile and to that extent reduce the accuracy of flight. As illustrated in FIG. 4, the trapping of the explosive gases within the attachment by the husk **26**, although momentary, is sufficient to permit the projectile **28** to get well started on its flight before the husk is emitted and the gases begin to escape. The result is that little if any disturbance of the flight of the projectile results from these gases.

In view of the above description of one embodiment of this invention illustrating the principles thereof, it will be apparent to those skilled in the art that many of the structural details herein disclosed can be varied without departing from the novel subject matter of this invention. It is preferred, therefore, that the scope of protection afforded hereby be determined by the claim as the selected embodiment is provided for illustrative purposes only.

What is claimed is:

A firearm comprising in combination a projectile, an expansible, detachable husk secured to said projectile, said husk being cup shaped and having an end wall and a plurality of integral, separable, curved wall portions, a gun barrel having a projectile bore, and a projectile stabilizing means at the exit end of said barrel having an apertured husk and gas confining cylindrical wall forming a chamber with an internal diameter greater than that of said bore, said means having a projectile guiding exit passage having a diameter less than that of said bore and providing a light press fit for said projectile and a compression fit for said husk, said means also having a conical passage converging into said exit passage and acting to contract said husk for movement through said passage, said husk being detached in and expanded into contact with the wall of said chamber and being contracted and delayed by said conical passage for trailing movement through said exit passage behind said projectile.

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