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J. H. CHURCH ET AL

2,424,970

EXPLOSIVE PROJECTILE

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Fig. 1.

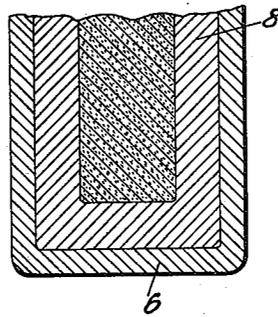
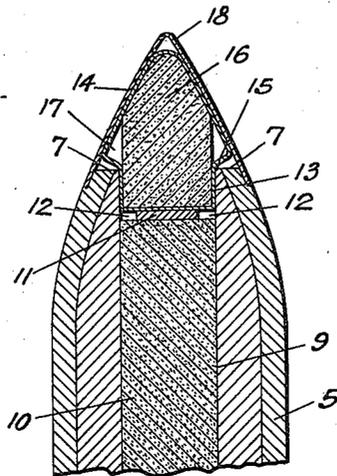


Fig. 2.

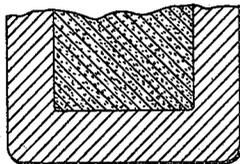
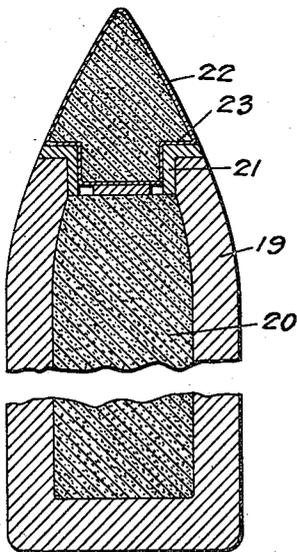
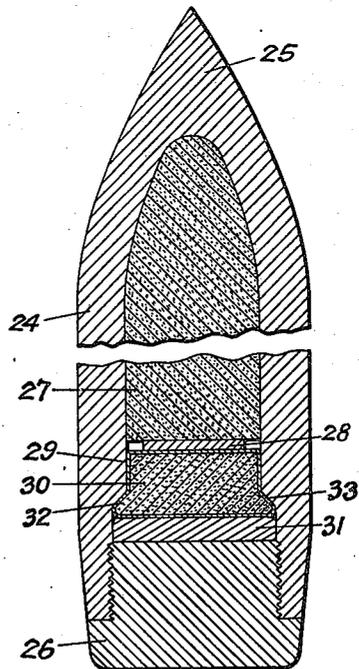


Fig. 3.



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EXPLOSIVE PROJECTILE

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9 Claims. (Cl. 102—56)

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1

The invention described herein may be manufactured and used by or for the Government for governmental purposes, without the payment to us of any royalty thereon.

This invention relates to an explosive projectile.

In U. S. Patent 639,214 and in French Patents 504,857 and 516,457 there are shown projectiles loaded with nitroglycerin and an absorbent which remain insensitive until the nitroglycerin is separated from the absorbent under the influence of centrifugal force due to rotation of the projectile. Because of the dead space occupied by the absorbent the explosive force of the nitroglycerin is generally insufficient to properly fragment the projectile.

The purpose of this invention is to provide a projectile which is arranged to carry a relatively large charge of high explosive that is initiated by a relatively small charge of nitroglycerin which serves as a supersensitive fuse. The specific nature of the invention as well as other objects and advantages thereof will clearly appear from a description of several embodiments as shown in the accompanying drawings, in which:

Fig. 1 is a longitudinal sectional view of a projectile constructed in accordance with the invention.

Figs. 2 and 3 are similar views of modifications.

Referring to Fig. 1 there is shown a projectile comprising a jacket or casing 5 which in the instance of a small arms bullet is preferably made of gilding metal capable of being engraved by the rifling of a gun barrel. The jacket 5 includes a closed base 6 and an open front end defined by an annular rim 7.

A similarly shaped lead core 8 is fitted in the jacket and has an elongated chamber 9 which receives a relatively large main charge 10 of a high explosive whose front end is spaced a short distance from the front end of the chamber. A thin disk or cushion 11 of a yielding material such as lead or wax is placed on the front end of the main charge 10 and is provided with openings 12.

A capsule which may be made of thin copper material includes a cylindrical portion 13 which is inserted into the mouth of the chamber 9 and retained in any suitable manner, conveniently by frictional engagement in the mouth of the lead core 8. The capsule is formed with an ogival head 14 and includes an annular flanged shoulder 15 which overlies the rim 7, and, in this instance, is spaced from the rim.

The capsule contains a relatively small charge

2

16 of nitroglycerin mixed with an absorbent such as kieselguhr or fuller's earth which may occupy the entire space in the capsule or may be reshaped as shown to clear the annular pocket 17 formed by the shoulder 15.

The charge 16 is normally insensitive but becomes sensitive after the projectile is some distance in flight beyond the muzzle of the gun, the nitroglycerin separating out from the absorbent under the influence of centrifugal force and being distributed along the wall of the capsule and in the pocket 17. On impact with an object such as an airplane wing or balloon cloth, the head of the capsule will be crushed or deformed or forced rearwardly and will initiate explosion of the nitroglycerin which in turn will detonate the main charge 10.

An ogival windshield 18 may be mounted on the jacket 5 if desired and will be capable of shearing or deforming on impact to provide for deformation of the capsule as previously described.

The projectile shown in Fig. 2 comprises a shell 19 filled with a main charge 20 and having an opening in its front end for receiving a flanged bushing 21 of a yielding material such as lead. A capsule 22 fitting in the bushing has a flanged shoulder 23 seated on the flange of the bushing.

In Fig. 3 there is shown a shell 24 having a closed head 25 and an open rear end which is closed by a plug 26. Within the shell there is a large main charge 27 which is loaded or held in any suitable manner against rearward movement on set-back, as by a disk 28. A capsule 29 containing a small charge 30 of nitroglycerin and an absorbent is placed in rear of the main charge or of disk 28 when the latter is employed, and it is seated on a disk 31 of a yielding material such as lead. The capsule has an annular shoulder 32 fitting against an inclined wall 33 of the shell. On impact the washer or disk is free to move forwardly to compress the shoulder and thereby insure initiation of the nitroglycerin that has been separated from the absorbent during flight.

By virtue of the foregoing arrangements a projectile of small caliber may retain its usual proper form factor, the provision of which in a mechanical nose fuse is practically impossible of achievement.

We claim:

1. A projectile comprising a jacket having an open front end, a lead core in the jacket having a chamber, a main explosive charge in the chamber and spaced from the front end thereof, a

3

cushion in front of the main charge, a capsule inserted in the mouth of the chamber in front of the cushion and having an ogival head with a flanged shoulder overlying the rim of the jacket and spaced therefrom, an initiating charge of nitroglycerin mixed with an adsorbent in the capsule and adapted to be separated from the adsorbent under the influence of centrifugal force to be exploded on impact.

2. A projectile comprising a jacket having an open front end, a lead core in the jacket having a chamber, a main explosive charge in the chamber and spaced from the front end thereof, a capsule inserted in the mouth of the chamber in front of the main charge and having an ogival head with a flanged shoulder overlying the rim of the jacket and spaced therefrom, an initiating charge of nitroglycerin mixed with an adsorbent in the capsule and adapted to be separated from the adsorbent under the influence of centrifugal force to be exploded on impact.

3. A projectile comprising a casing having a chamber open at its front end, a main explosive charge in the chamber, a capsule inserted in the mouth of the chamber and having an ogival head with a flanged shoulder overlying the rim of the casing and spaced therefrom, an initiating charge of nitroglycerin mixed with an adsorbent in the capsule and adapted to be separated from the adsorbent under the influence of centrifugal force to be exploded on impact, and an ogival windshield on the casing and inclosing the ogival head of the capsule.

4. A projectile comprising a casing having a chamber open at its front, a main explosive charge in the chamber, a capsule inserted in the mouth of the chamber and having an ogival head with a flanged shoulder overlying the rim of the casing and spaced therefrom, an initiating charge of nitroglycerin mixed with an adsorbent in the capsule and adapted to be separated from the adsorbent under the influence of centrifugal force to be exploded on impact.

5. A projectile comprising a casing having a chamber open at its front, a main explosive charge in the chamber, a capsule inserted in the mouth of the chamber and having an ogival head with a flanged shoulder overlying the rim of the casing, an initiating charge of nitroglycerin mixed with an adsorbent in the capsule and adapted to be separated from the adsorbent under the influence of centrifugal force to be exploded on impact, an ogival windshield on the casing and inclosing the ogival head of the capsule.

6. A projectile comprising a casing having a chamber open at its front, a main explosive charge in the chamber, a capsule inserted in the mouth

4

of the chamber and having an ogival head with a flanged shoulder overlying the rim of the casing, an initiating charge of nitroglycerin mixed with an adsorbent in the capsule and adapted to be separated from the adsorbent under the influence of centrifugal force to be exploded on impact.

7. A projectile comprising a casing having a chamber open at its front end, a bushing of a yielding material in the casing at the mouth of the chamber and having a flange seated on the rim of the casing, a main explosive charge in the chamber, a capsule inserted in the bushing and having an ogival head with a flanged shoulder overlying the flange of the bushing, an initiating charge of nitroglycerin mixed with an adsorbent in the capsule and adapted to be separated from the adsorbent under the influence of centrifugal force to be exploded on impact.

8. A projectile comprising a casing having a chamber, a main explosive charge in the chamber, a capsule in the chamber in rear of the main charge and having a flanged shoulder under a portion of the wall of the casing, an initiating charge of nitroglycerin mixed with an adsorbent in the capsule and adapted to be separated from the adsorbent under the influence of centrifugal force to be exploded on impact, and a disk of a yielding metal in rear of the capsule and arranged to move forwardly on impact to deform the capsule.

9. A projectile comprising a casing having a chamber, a main explosive charge in the chamber, a capsule in the chamber in rear of the main charge and having a flanged shoulder under a portion of the wall of the casing, an initiating charge of nitroglycerin mixed with an adsorbent in the capsule and adapted to be separated from the adsorbent under the influence of centrifugal force to be exploded on impact.

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