March 30, 1943. W. T. MOORE 2,314,891

PROJECTILE

Filed Jan. 22, 1941

Fig. 1.

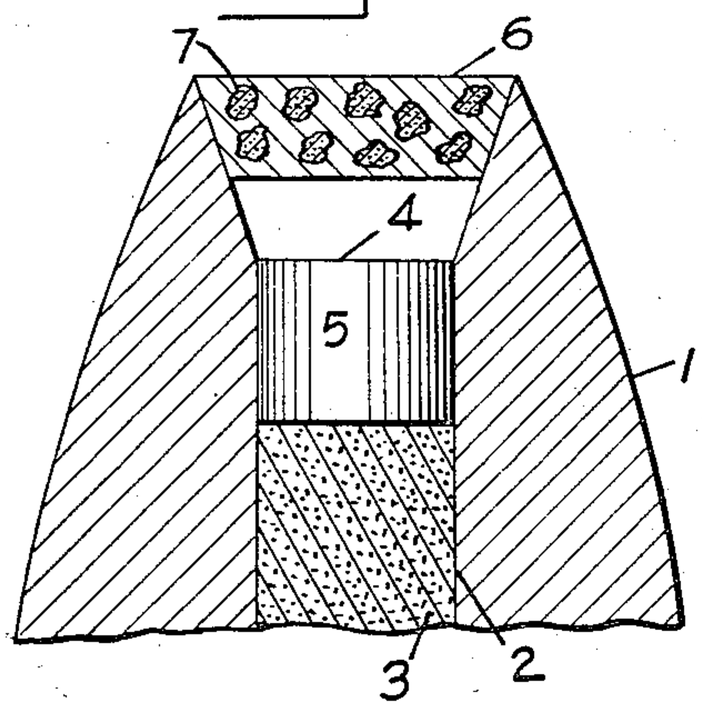


Fig. 2.

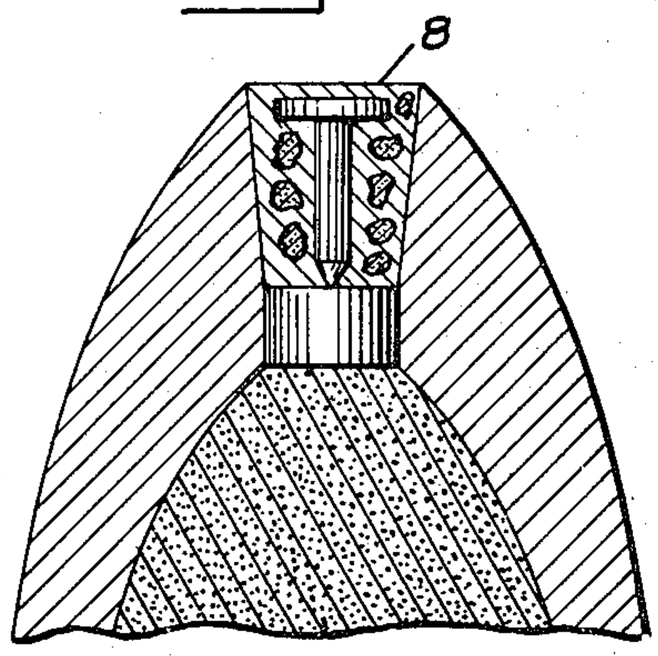
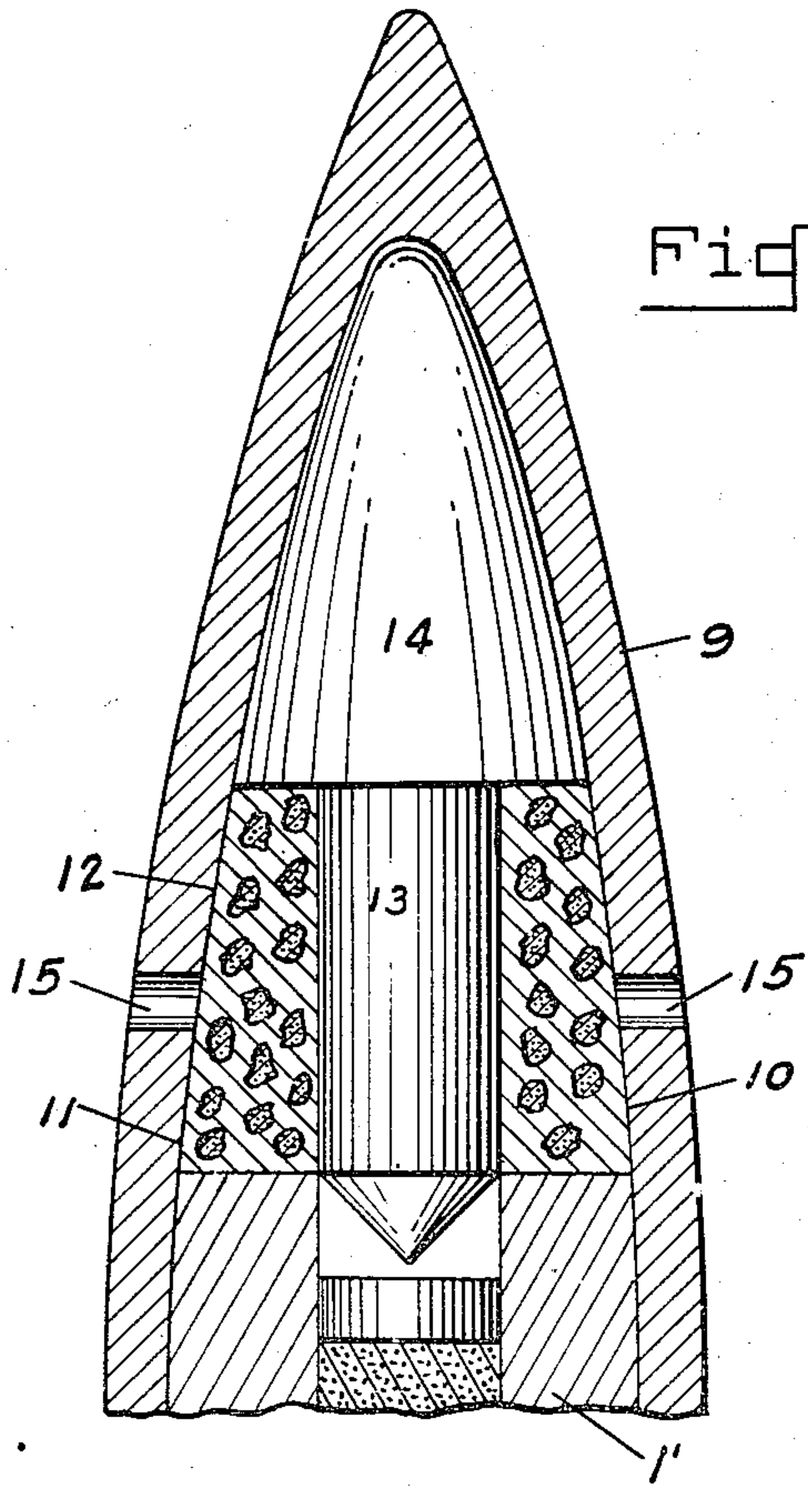


Fig. 3.



INVENTOR
Wiley T. Moore
BY E. J. Kessenich & J. H. Church
ATTORNEY

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PROJECTILE

Wiley T. Moore, United States Army,
Laverne, Okla.

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11 Claims. (Cl. 102—76)

(Granted under the act of March 3, 1883, as amended April 30, 1928; 370 O. G. 757)

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

This invention relates to shell fuses in general, and in particular to fuses for small arms or medium explosive projectiles wherein a barrier interposed to prevent detonating action on the primer is processed in flight to negative its character as a barrier.

Combustible or fusible barriers are already known in the art. The present invention has reference to a barrier having fusible or combustible components which vanish in flight but leave behind a skeleton structure of the original barrier. This makes a safer fuse than the types wherein there is a possibility of the entire barrier failing in storage or handling.

It is therefore an object of this invention to produce a fuse having a detent which partly breaks down in flight but leaves a restraining skeleton form in detent position.

It is another object of this invention to produce a fuse which will be safe in handling and storage.

To these and other ends, the invention consists in the construction, arrangement and combination of elements described hereinafter and pointed out in the claims forming a part of this specification.

A practical embodiment of the invention is illustrated in the accompanying drawing wherein:

Figure 1 is a fragmentary sectional elevation of the forward end of a projectile showing the plug of the invention guarding a primer in a fuse of the pinless type;

Figure 2 is a similar view showing a firing pin embedded in the plug;

Figure 3 is a similar view of another modification.

Referring to the drawing by characters of reference there is shown in Figure 1 a projectile body 1 with a central bore 2 containing an explosive material 3. Superimposed on explosive 3 is a primer 4 in a container 5. Above primer 4 the mouth of bore 2 is flared outwardly and inserted therein is a plug 6. Plug 6 is a non-combustible and high fusing material and contains pores 7 having combustible, volatilizing or low fusing material or any other heat destructible material therein. The plugs are preferably composed of a refractory and combustible materials. Following is one example of a desirable mixture: 45% alumina or any other suitable refractory, 45% confectioners sugar, and 10% graphite. All these ingredients are in powdered form and mixed thoroughly before being introduced into dies which shape the plugs. The proportions given may be varied to increase or decrease the refractories, as desired. This example is not, however, to be deemed as limiting, since the invention covers broad aspects as pointed out in the objects of invention and in the appended claims. The combustible portions of the plugs may be other substances besides those mentioned, such as wood flour, grain flour, or any other carbonaceous material in divided form, finely or otherwise. The role of the combustible material is to volatilize under heat and thus leave the refractory residue as porous as a sponge. Without any binder the porous refractory residue is brittle and will disintegrate under blows of varying degree depending upon its constitution.

On firing there is a considerable rise in temperature in the projectile due to contact with the barrel rifling and this heat is transferred to the plug to cause volatilization combustion or fusing of the inserted material depending upon its character. This heating effect is maintained in flight by friction with the atmosphere. Upon volatilization or flowing of the filling material a skeleton structure is left behind which will yield on impact forces to permit access to the primer. In the case of Figure 1 a portion is cut out of the target and functioning as a piston advances into the central opening to compress the air therein and thus fire the primer. The matrix of the plug will be so designed that in case of accidental volatilization, fusing or combustion of its binder it will still stand as an effective barrier against impacts encountered in ordinary handling and storage.

The plug may consist of any non-combustible porous material whether refractory or not. For instance, a spongy metal, such as aluminum may be used. The carbonaceous material may be incorporated therein in dissolved form and subsequently dried.

The modification shown in Figure 2 is similar to that of Figure 1 in general functioning except that a firing pin 8 has been included. The pin is shown as embedded in the porous plug but may lie without the plug or may be partially embedded therein or incorporated in any other way whereby the plug acts as a barrier between pin and primer.

In Figure 3 is shown a projectile 1' with a jacket 9. The body 1' terminates short of the nose portion of the jacket 9 to provide a cham-

ber 10. On the front face 11 of the body 1 is placed a ring 12 of the porous material. The shank 13 of a firing pin is received centrally of ring 12 and an enlarged head 14 of the pin engages the forward end of the ring 12 holding the pin in safety position. Vents 15 are provided in the jacket to facilitate volatilization or combustion or efflux of the heat destructible material.

I claim:

1. A fuse for projectiles comprising a heat-resisting barrier member, with pores therein and heat destructible material in said pores.

2. A fuse for projectiles comprising a non-combustible barrier member with pores therein and combustible material in said pores.

3. A fuse for projectiles comprising a refractory barrier member with pores therein and a non-refractory material in said pores.

4. A fuse for projectiles having a barrier member comprising a mixture of heat-resisting and heat-destructible materials.

5. A fuse for projectiles having a barrier member comprised of a mixture of refractory and non-refractory materials.

6. A fuse for projectiles having a barrier member comprising a mixture of refractory materials and combustible materials.

7. A fuse for projectiles having a barrier member comprising a mixture of alumina and carbonaceous materials.

8. A projectile comprising a hollow shell body, a main explosive charge therein, a primer forward thereof, said shell body having an opening forward of said primer and a plug in said opening, said plug comprising a heat-resisting material with pores therein, and a heat-destructible material in said pores.

9. A fuse for projectiles comprising a primer and a firing pin and a safety member interposed between said primer and pin, said safety member comprising a heat-resisting material having pores and a heat-destructible material in said pores.

10. A fuse as in claim 9 in which the firing pin is emedded in the safety member.

11. A fuse for projectiles comprising a primer and a firing pin therefor, and a barrier member interposed between said pin and primer, said barrier member comprising a mixture of refractory materials and combustible materials.

WILEY T. MOORE.