April 13, 1943. F. KOWALSKI, JR 2,316,172

BULLET

Filed Feb. 21, 1939

Fig. 1.

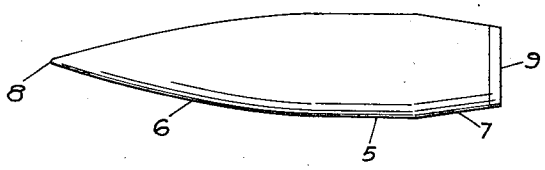
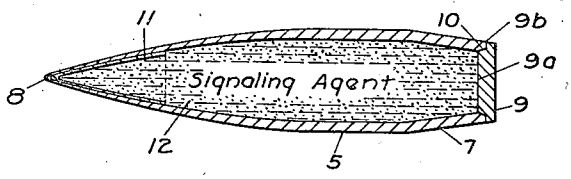



Fig. 2.




Inventor
Frank Kowalski, Jr.
By G. J. Kessenich & J. H. Church
Attorneys

Patented Apr. 13, 1943

2,316,172

# UNITED STATES PATENT OFFICE

2,316,172

## BULLET

Frank Kowalski, Jr., Fort Benning, Ga.

Application February 21, 1939, Serial No. 257,649

2 Claims. (Cl. 102—60)

(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.

The subject of this invention is a bullet.

The effectiveness of the fire of guns is determined by its accuracy. Since preliminary calculations and sight settings may be in error it is necessary to observe the fire for the purpose of determining the sense and magnitude of the deviations of the impact with respect to the target in order that appropriate adjustment may be made. Observation of the impact of small arms bullets is extremely difficult and generally impossible under the terrain conditions with the exception of dry, dusty ground.

The purpose of this invention is to provide a bullet which will have the signaling and indicating characteristics of an explosive artillery shell and thereby facilitate the observation of the effects of small arms fire. In accomplishing this purpose by means of a signaling agent carried by the bullet it is necessary to consider the ability of the bullet to withstand the shock of firing, its reaction to the propelling gases while in the bore of the barrel, a maximum volumetric capacity compatible with strength, ballistic efficiency in flight, and liberation of the contained agent on impact. In addition to satisfactorily meeting the foregoing requirements the bullet must be capable of being conveniently manufactured and loaded and fired in a normal manner from service weapons.

The specific nature of the invention as well as other objects and advantages thereof will clearly appear from a description of a preferred embodiment as shown in the accompanying drawing in which:

Fig. 1 is a view in side elevation of the improved bullet, and

Fig. 2 is a longitudinal sectional view thereof.

Referring to the drawing by characters of reference the bullet comprises a jacket or shell of conventional design and including a cylindrical body 5, an ogival head 6 and a boat tail 7. The body and tail are made of sufficient wall thickness and strength to withstand the accelerating forces in the bore of the rifle while affording maximum volumetric capacity. The head is of gradually decreasing thickness towards the front to provide a thin, weak point 8 which will be readily ruptured or opened on impact.

The rear end of the jacket is closed by a plug 9 which may be of steel and is fitted tightly in place so as to provide an effective seal and prevent gas pressure from entering the interior of the bullet and exerting pressure to rupture the jacket. The plug is formed with a reduced front portion 9a having a force fit within the jacket and supporting the walls against collapse. The formation of the reduced portion provides a peripheral recess 9b for receiving the annular lip 10 of the jacket. This arrangement furnishes a strong structure against which the powder gases act to propel the bullet through the barrel and at the same time conveniently establishes a seal.

A hollow conical plunger 11 disposed loosely within the ogival head is capable of moving rearwardly as the head yields and is crushed on impact. The plunger acts as a piston against an agent carried within the bullet and tends to burst or rupture the jacket further to the rear and to spray the agent rearwardly.

The jacket when closed by the plug forms a container in which may be carried a liquid, solid or gaseous agent 12 adapted for signaling, illuminating or incendiary purposes. As an example titanium tetrachloride which hydrolizes in the atmosphere will produce a puff of dense white smoke ten to fifteen feet in diameter and persisting for about a minute.

The bullet is conveniently loaded prior to assembling the rear plug 9 but it is obvious that the bullet may be considered as a hollow shell with the signaling agent introduced in other well known manners, as by means of an aperture in some part of the wall which aperture would subsequently be plugged.

Tests of this bullet have shown that the ogival head will be ruptured on impact with all kinds of obstacles and irrespective of the angle of incidence.

I claim:

1. A bullet comprising a hollow shell having an ogival head weakened so as to be crushable on impact, a thin-walled hollow conical plunger nested loosely in the ogival head and movable rearwardly within the shell when the head is crushed on impact, and a burst indicating agent completely filling the shell adapted to be compressed by the plunger to rupture the shell and be released.

2. A bullet comprising a hollow shell having an opening in the base and a closure plug press-fit therein, and having an ogival head weakened so as to be crushable on impact, a thin-walled hollow conical plunger nested loosely in the ogival head and movable rearwardly within the shell when the head is crushed on impact, and a burst indicating agent completely filling the shell and adapted to be compressed by the plunger on impact to force out the indicating agent rearwardly of the bullet.

FRANK KOWALSKI, JR.