

UNITED STATES PATENT OFFICE.

DAVID C. BEAMAN, OF DENVER, COLORADO.

VISIBLY-TRAVELING PROJECTILE.

SPECIFICATION forming part of Letters Patent No. 675,845, dated June 4, 1901.

Application filed December 19, 1899. Serial No. 740,942. (No specimens.)

To all whom it may concern:

Be it known that I, DAVID C. BEAMAN, a citizen of the United States of America, residing at Denver, in the county of Arapahoe and State of Colorado, have invented certain new and useful Improvements in Visibly-Traveling Projectiles; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawing, which forms a part of this specification.

My invention relates to improvements in projectiles.

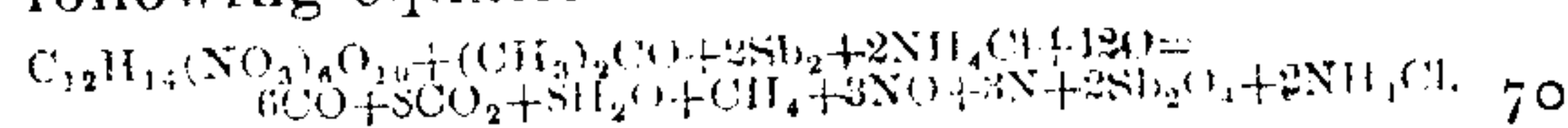
The improvement consists in making the projectile visible while traveling through the air.

To be more specific, the improvement consists in providing the projectile with a composition or substance capable of ignition from the powder or other explosive of the driving charge or by friction with the inside of the barrel of the gun or other firing implement or machine or by friction with the air, whereby a visible smoke or streak, either dark or luminous, is produced during the passage of the projectile from the gun toward the object aimed at or a substance which will by friction alone diffuse, dispense, emit, or give off a dust or other substance sufficient to make the path of the projectile visible.

My object is to enable the gunner and others to readily observe whether the shooting is too high or too low or too much to the right or left of the object, as well as any other inaccuracies of aim, and better enable the marksman to correct his aim and regulate the amount of explosive to be used, especially in firing at moving objects or targets, animate or inanimate.

I accomplish the aforesaid object by coating the shot, bullet, or other form or kind of projectile with a substance or compound that emits or diffuses fumes, smoke, or vapor of more or less density during comparatively slow combustion after ignition either by the heat or flame of the explosion produced by the discharge of the gun or after ignition by friction with the bore of the gun or with the

air or otherwise or by friction with the air without ignition. The compound I prefer for the purpose consists of guncotton or hexnitrate of cellulose, $C_{12}H_{14}(NO_3)_6O_{10}$, dissolved to saturation in acetone, $(CH_3)_2CO$, afterward incorporated with an ammonium salt, such as the chlorid, $(NH_4)Cl$, together with a certain proportion of finely-divided metallic antimony (Sb_2) or the regulus of that metal, and the acetone subsequently removed as far as requisite by evaporation or other means. The chemical changes that take place during the combustion of this compound are more or less uncertain, owing to the presence of a variable proportion of acetone and of atmospheric oxygen; but for the purpose of illustration the reactions involved may be expressed by the following equation:



That is to say, the carbon, hydrogen, and nitrogen of the guncotton and acetone undergo combustion and more or less complete oxidation to transparent gaseous compounds. The antimony oxidizes to antimonie oxide and forms dense white fumes. The ammonium chlorid sublimes at the instant of ignition, but immediately condenses in copious white fumes. It is these fumes that are intended to indicate the path of the charge or projectile through the atmosphere.

Having thus described my invention, what I claim is—

1. A projectile exteriorly coated with a substance capable of ignition resulting either from the explosion or friction or both, whereby the projectile or its course is rendered visible after leaving the gun.

2. A projectile exteriorly coated with a substance capable of such chemical reaction resulting either from the explosion or the friction of its passage, as to render the projectile or its course visible after it leaves the gun or other implement.

In testimony whereof I affix my signature in presence of two witnesses.

DAVID C. BEAMAN.

Witnesses:

A. J. O'BRIEN,
GRACE MYTINGER.