H. B. FORBES.

PROJECTILE.

APPLICATION FILED MAR. 5, 1915.

1,275,669. Patented Aug. 13, 1918.

Fig. 1

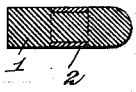


Fig. 1a

Fig. 2a

Fig. 2

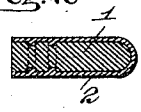


Fig. 3

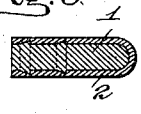


Fig. 3a

Fig. 4a

Fig. 4

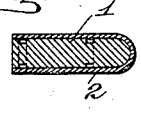


Fig. 5

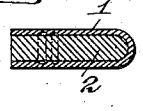
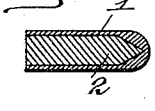


Fig. 5a

Fig. 6a

Fig. 6



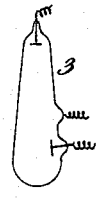


Fig. 8

Fig. 7a

Fig. 7

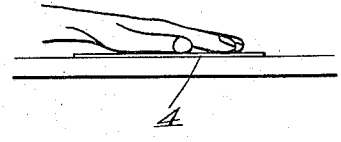
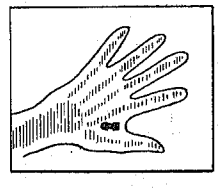


Fig. 8a



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UNITED STATES PATENT OFFICE.

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PROJECTILE.

1,275,669. Specification of Letters Patent. Patented Aug. 13, 1918.

Application filed March 5, 1915. Serial No. 12,250.

To all whom it may concern:

Be it known that I, HARRY BENJAMIN FORBES, a citizen of the United States, resident of Ogden, county of Weber, State of Utah, have invented a certain new and useful Projectile, of which the following is a specification.

This invention relates to improvements in projectiles and has for its object the provision for positively identifying the projectile and at the same time without reducing the efficiency of the projectile either as to range or penetrability.

A further object is to produce a projectile which may be positively identified while within the body of the individual and without removal from the body.

The particular object I have in view is the production of a projectile which may be used by officers of the law and which may be identified while within the body of the person hit even after the wound has healed.

Further objects will more fully appear from the following specification and accompanying drawings considered together or separately.

In the drawings,

Figures 1 to 6 inclusive are longitudinal sections of bullets embodying my invention;

Figs. 1ª to 6ª inclusive are skiagraph negatives obtained by the respective bullets illustrated in Figs. 1 to 6 inclusive;

Fig. 7 is a section of a buckshot embodying my invention;

Fig. 7ª is a perspective view of the core of the buckshot illustrated in Fig. 7;

Fig. 8 is a diagrammatic view of the apparatus used for making a negative of the projectile embedded in the human hand; and

Fig. 8ª is a positive skiagraph showing the projectile illustrated in Fig. 1 embedded in the flesh between the metacarpal bones of the thumb and forefinger of the left hand.

In all views like parts are designated by the same reference characters considered together or separately.

In carrying out my invention I make a projectile having internal characteristics by means of which its identity may be established by suitable tests. These tests may be made by mechanical or chemical means, but preferably by means of those rays which act upon a sensitive plate to produce a skiagraph or which may produce an image on the fluoroscope. In its broadest aspects my improved projectile is of the conventional or usual outside form, but with internal characteristics permitting ready and certain identification. If the projectile be made with a core and a surrounding sheath with grooves on the outside of the core, or inside of the sheath, it is possible to so construct these grooves as to shape, size and number that a definite and certain character will be formed which will permit of absolute identification. If the core be surrounded with bands of the same or different material, the width, number or cross-section of such bands will form also accurate identifying media. The shapes of the core or internal configuration of the sheath will permit equal certainty of identification. If the core and sheath be made of different materials a still further number of permutations may be secured. Such a projectile may be identified by cutting it longitudinally or otherwise so that these identifying media are disclosed. I prefer, however, to make the projectile identifiable utilizing those rays which will pass through the human body and will act upon the sensitive plate or the screen of the fluoroscope. These rays may be the Röntgen or X-rays or various forms of radio active rays such as those of Becquerel. According to the principle of such rays they pass directly from their source to the plate or screen without being deflected by any intervening substance. Some materials offer a greater obstruction to the passage of the rays than others. Lead is a material which is cheap and abundant and acts very materially in arresting the passage of the rays. Aluminum is an excellent substance offering a relatively small obstruction to the passage of the rays. Other materials have a greater or lesser effect upon the passage of the rays. It is desirable, however, to employ lead or an alloy thereof as the predominant portion of the projectile as it will be more like the commercial bullet and will act substantially the same in the firearm, having the usual range and penetrability.

Figs. 3, 4, 5 and 6 show a series of projectiles all of the same size and exterior configuration and each having a core of different configuration from each other.

In Fig. 1 the projectile is composed of a

core 1 formed of one material and a casing or sheathing 2 formed of another material. As examples of suitable materials, the core 1 may be made of lead and the casing 2 of aluminum. Assuming that such projectile is in the form of a bullet and enters the flesh between the metacarpal bones as shown in Fig. 8ª, the positive skiagraph will indicate the outline of the bullet as illustrated in Fig. 8ª.

Fig. 1ª illustrates on an enlarged scale the negative skiagraph showing by the light colored section the very inconsiderable passage of the rays through the lead, and the dark section the very considerable passage of rays through the aluminum casing.

Figs. 2 to 6 inclusive show various examples of indicating different profiles of the core, or inner surface of the covering or sheath.

In all the embodiments of the invention the outside shape of the projectile is the conventional one, so that it may be used in any firearm without loss of efficiency.

In Fig. 2 the core is provided with a plurality of grooves and the core is surrounded by a casing of a material which offers less obstruction to the passage of the rays than the core. The result would produce a skiagraph negative somewhat the same as illustrated in Fig. 2ª.

In Fig. 3 the core is provided with ribs with inclined faces producing a skiagraph negative somewhat as illustrated in Fig. 3ª.

In Fig. 4 the core is provided with grooves and a casing surrounds these grooves leaving open spaces between the core and casing. This will allow the maximum amount of rays to pass through them and as a result the negative will be somewhat as illustrated in Fig. 4ª.

In Fig. 5 the grooves are formed in the casing which will produce a negative somewhat as shown in Fig. 5ª.

In the structure illustrated in Figs. 4 and 5, the projectile may be made wholly of the same material, for example lead, or it may be made of two materials offering relatively great obstruction to the passage of the rays, such as a lead core and copper sheathing. If wholly of lead, nevertheless the rays will pass through the sheathing opposite the grooves, as lead must be of material thickness, usually at least 1.5 mm. to wholly obstruct the rays.

In Fig. 6 the identification of the profile is obtained by changing the end, such end being sharp-pointed as shown, which will produce a negative as is illustrated in Fig. 6ª.

Fig. 7ª illustrates a core of lead forming the center of a buckshot, the spaces between the points of the core to make up the shot being formed of aluminum or other material offering less obstruction to the passage of the rays. The configuration of the core is such that its characteristic shape may be observed from various angles.

From the illustrations it is apparent that the projectile may be modified in very many ways without departing from the spirit of the invention, so long as the skiagraph or fluoroscope shadow is sufficiently characteristic to be identified. To this end it is sufficient to vary the shapes and proportions of the materials which comprise the projectile.

The number of parts of the projectile may be varied as desired, for example while I show but two parts to each projectile each may be made of three or more parts, and they may be made of lead, aluminum or copper, or any other material which, if they offer different degrees of obstruction to the passage of the rays, will produce a characteristic skiagraph or fluoroscope image.

Fig. 8 illustrates the manner of taking a skiagraph. In the example chosen for illustration, the Crookes tube 3 is placed above the plate 4, the hand containing the projectile being between the tube and the plate as shown. This will produce a negative from which a positive somewhat similar to that illustrated in Fig. 8ª may be produced.

Various substances may be used for the making of the projectile.

The invention may also be employed not only for the taking of skiagraphs upon sensitive plates, but also for direct examination by means of the fluoroscope.

The profile of a part of the projectile may be modified to an enormous degree so as to make practically an endless number of profiles which may be identified. Only certain profiles are illustrated to show the principles of the invention.

One very valuable feature of my invention is that a bullet may be identified in the human body after the wound has been healed and without extracting the bullet. Criminals who may be shot by an officer of the law and receive a bullet may temporarily escape capture until the wound has healed, but according to my invention the person suspected upon being examined through the X-ray the identity of the bullet will be established. If each law officer is supplied with bullets having the certain internal characteristics so that they may be identified, the criminal will be certainly identified as the individual who was shot by that particular officer.

In order to obviate the necessity of producing a large number of projectiles each capable of producing a different picture I prefer to provide, for use in a State for example, one type for the militia, one for the police, one for the sheriff and one for industrial organizations, such as railway police. In case a person were struck by

a bullet an X-ray examination would at once show whether or not the wound had been inflicted by a peace officer and if so to which branch of the service he belonged and the place at which the shooting occurred.

In the following claims I employ the term "Röntgen ray" but it is to be understood that any rays which pass in a straight direction through flesh and bone and which are obstructed to a greater or less extent by other substances, may be employed, such as the various forms of radio active rays.

In accordance with the provisions of the patent statutes, I have described the principle of my invention, together with the apparatus which I now consider to represent the best embodiment thereof; but I desire to have it understood that the apparatus shown is merely illustrative and that the invention may be carried out in other ways.

Having now described my invention, what I claim as new and desire to secure by Letters Patent, is:

1. A projectile having an outer casing and internal irregularities of configuration capable of producing a skiagraph or fluoroscope image of distinctive characteristics.

2. A projectile having an inner core and an outer casing, with internal irregularities of one or both, the casing being composed of a material having a greater degree of permeability to the passage of the Röntgen ray than the core, whereby a characteristic skiagraph or fluoroscope image can be produced.

3. A projectile composed of a plurality of substances possessing different degrees of permeability to the passage of the Röntgen ray, that substance possessing the greater degree of permeability forming the exterior of the projectile.

4. A projectile composed of parts of different materials having different degrees of permeability to the passage of the Röntgen ray, the profile of one part at least being irregular, that substance possessing the greater degree of permeability forming the exterior of the projectile.

5. A projectile composed of a core and a part surrounding the core composed of a material possessing a greater degree of permeability than the core to the passage of the Röntgen ray.

6. A projectile composed of a core having an irregular profile and a part surrounding the core composed of material possessing a greater degree of permeability to the passage of the Röntgen ray.

7. A projectile composed of a core of lead having an irregular profile surrounded by a casing of material having a greater degree of permeability to the passage of the Röntgen ray.

8. A projectile composed of a core of lead of irregular profile, and a surrounding casing of a regular and conventional profile, said case being composed of a material having a greater degree of permeability to the passage of the Röntgen ray than the core.

9. A projectile composed of a plurality of substances possessing different degrees of permeability to the passage of the Röntgen ray, that substance having the greater degree of permeability to the ray being located relatively to the other material so that the ray can pass through the material of greater permeability without passing through the material of less permeability.

10. A projectile composed of a plurality of materials one of which possesses a greater degree of permeability to the passage of the Röntgen ray than the other, that material having the less degree of permeability presenting a characteristic silhouette when viewed from three planes.

11. A projectile composed of a plurality of materials one of which possesses a greater degree of permeability to the passage of the Röntgen ray than the other, that material having the less degree of permeability presenting a characteristic irregular silhouette when viewed from three planes.

12. A spherical projectile composed of a plurality of materials one of which possesses a greater degree of permeability to the passage of the Röntgen ray than the other, that material having the less degree of permeability presenting a characteristic silhouette when viewed from three planes.

13. A spherical projectile composed of a plurality of materials one of which possesses a greater degree of permeability to the passage of the Röntgen ray than the other, that material having the less degree of permeability presenting a characteristic irregular silhouette when viewed from three planes.

14. A projectile having a casing of conventional form, said casing being formed of a material containing aluminum, and a core formed of a material containing lead, said core being of such configuration as to produce a skiagraph or fluoroscope image of distinctive characteristics.

15. A projectile having a casing of conventional form, said casing being formed of aluminum, and a core formed of a material containing lead, said core being of such configuration as to produce a skiagraph or fluoroscope image of distinctive characteristics.

16. A projectile having a casing of conventional form, said casing being formed of a material containing aluminum, and a core formed of lead, said core being of such configuration as to produce a skiagraph or fluoroscope image of distinctive characteristics.

17. A projectile having a casing of conventional form, said casing being formed of aluminum, and a core formed of lead, said core being of such configuration as to produce a skiagraph or fluoroscope image of distinctive characteristics.

This specification signed and witnessed this 25 day of Feb., 1915.

HARRY BENJAMIN FORBES.

Witnesses:

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