

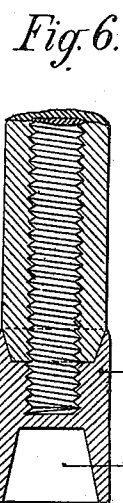
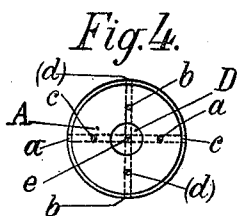
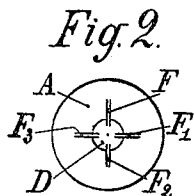
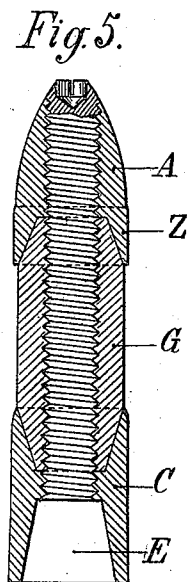
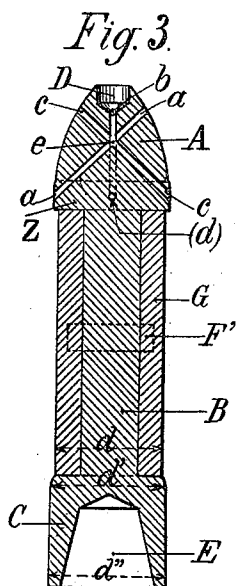
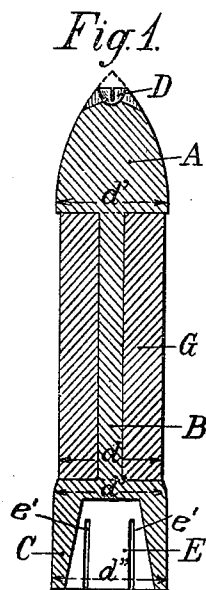
No. 644,361.

Patented Feb. 27, 1900.

J. LUCIANI.
PROJECTILE.

(Application filed June 27, 1899.)

(No Model.)



Witnesses
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UNITED STATES PATENT OFFICE.

JACQUES LUCIANI, OF PARIS, FRANCE.

PROJECTILE.

SPECIFICATION forming part of Letters Patent No. 644,361, dated February 27, 1900.

Application filed June 27, 1899. Serial No. 722,057. (No model.)

To all whom it may concern:

Be it known that I, JACQUES LUCIANI, of the city of Paris, in the Republic of France, have invented a new Projectile, which is fully set forth in the following specification.

My invention has for its object to secure me the property of the new projectile which I have invented and which is differentiated from those employed heretofore as much by its construction as by the shape of its ends.

So far as the construction is concerned I may remark that up to now the projectiles for portable warlike weapons have to a large extent been formed by a lead core and by a thin sheathing of harder metal. This mode of construction entails numerous inconveniences. If the metal of the sheathing is very hard, it causes considerable heating in the weapon and an alteration of the bore after a small number of shots. It results also in a reduction of the velocity in consequence of the too great friction. If the metal of the sheathing is relatively soft, it allows of deformations both in the weapon, where they result in a reduction of velocity and of precision of firing, and at the instant of penetrating resisting materials, where the result is a reduction of the penetration. It is to avoid all these defects that attempts have recently been made to construct projectiles of a single metal of medium hardness; but it is quite evident that this solution of the problem could not prove satisfactory as regards the defects hereinbefore mentioned. It possesses, moreover, the serious drawback of reducing the weight of the projectile or of leading to an exaggerated length, if it be desired to keep this weight unaltered.

My invention will be best understood by reference to the accompanying drawings, wherein I have shown projectiles of more than full size, and in which—

Figure 1 is a vertical sectional view. Fig. 2 is an end view looking from the top of Fig. 1. Figs. 3 and 4 are views corresponding to Figs. 1 and 2 of a modified form of projectile. Figs. 5 and 6 are sectional views of other modifications.

The construction of the projectile that I have adopted, Fig. 1, in order to avoid all the inconveniences hereinbefore mentioned consists in making the head A and the base C of

the projectile of a metal of appropriate hardness—such as steel, cast-iron, and the like—connecting the parts always by a rod B of a diameter considerably less than the bore of the weapon and filling the peripheral space G thus produced with lead or usually with a metal or an alloy having a suitable resistance combined with a high specific gravity, the weight of said metal being evenly distributed about the exterior of the projectile at its middle portion.

With regard to the rod B, connecting the head A to the base C, I may say at once that it may, according to circumstances, be integral with them, Figs. 1 and 3, or be independent of them and be fixed to them in any suitable manner, Figs. 5 and 6, and may be smooth, Fig. 1, or exhibit projections F' in the form of cylinders, Fig. 3, of screws, Figs. 5 and 6, or otherwise, in order to oppose the motion or the compression of the lead at the moment of firing.

The diameter d of the external lead body is less than the internal diameter of the weapon excluding the rifling-grooves, and in that case the rifling-grooves are engaged by two guides, one, Z, of the diameter d' , arranged at the base of the head, and the other formed by the periphery of the cylindroconical base C of the projectile in the following manner: The guide at the head is formed by a little cylindro part or flange Z, which may be placed with advantage adjacent to the lead sheath, the diameter of which is greater than the caliber excluding the rifling-grooves and the height of which may be varied according to the results aimed at. The guide at the base is formed either by a cylindrical part analogous to the foregoing (unless it is preferred to form it of several cylindrical parts of small height separated by grooves) or by a cylindroconical part having the diameters d' and d'' , d' being less than d'' , or at last by a special contrivance to be described later.

The advantages attained by this new construction are as follows:

First. The projectile is better balanced.

Second. For an equal length the projectile is heavier and more resisting.

Third. The heating of the weapon is considerably reduced, owing to the reduction of the friction and the non-liability of the projectile

to deformation during its course through the weapon.

Fourth. The velocity and the precision are increased for the same reasons.

5 Fifth. The alteration of the bore of the weapon is no longer to be feared.

Sixth. For equal velocity and weight the penetration and the range are increased, owing to the non-liability of the projectile to deformation on traversing more or less resisting media.

The head A of the projectile instead of being of one of the ordinary shapes has at its point a cavity D either of the shape of a truncated cone or of any other shape made in such a way that its front end forms a kind of circular cutter. However, I vary, according to 15 the object to be attained, the diameter of this circular cutter, the thickness of the cutting edges, and the depth of the recess. By this arrangement I have modified the *modus operandi* of the projectile, whereas when the projectile has a solid head it is obliged to push aside the fibers of the material to be penetrated in order to pass through said material and in doing so experiences a great resistance, (since this pushing aside is possible only to a certain extent.) The projectile, the head of which is made as I have indicated, begins by 25 cutting a hole having the diameter of the circular strip, and it has only then to push the fibers aside by the less amount. Nevertheless, the means that I have indicated can be applied to projectiles having a head terminating in a point or flattened extremity. 35

The wounds caused by a projectile having a hollow point are much less serious in their final consequences than those caused by a projectile having a point of the shape hitherto 40 used, because the wounds are always clean and the projectile carries away with it all the parts that it has cut out. On the other hand, the wounds are much more painful at the time, because they cannot close up completely immediately after the tissues have been passed through, so that a much larger surface of tissue is left exposed to the air, contact with which is very painful. Thus the chief object that should be sought by every army is attained—namely, placing every combatant hit 50 *hors de combat*, if only momentarily, in order to create disorder in the hostile ranks and to prevent the wounded from continuing to assist in securing the success of a battle, and 55 this without causing dangerous wounds slow to heal, like those caused by certain bullets to which some nations have been recently

obliged to have recourse, because they have recognized that the small-bore bullets with which they were armed produce no appreciable effect when they do not touch the head or the heart. A projectile thus formed may by a slight addition be made capable of producing a shrill whistling as it passes through the air. To effect this, it is sufficient to provide, as shown in Figs. 1 and 2, two saw-cuts F F² F' F³ across the edges of the circular cutter, forming the extreme head of the projectile. The openings thus made, the number and shape of which may, moreover, be greatly varied, allow the air that comes into the anterior cavity in the projectile during its course to escape with a noise capable of demoralizing an adversary outside the trajectory, but near to it. Instead of these grooves made with the saw or in addition to them there may be provided for the escape of the air passages *a b c f*, Figs. 3 and 4, crossing one another at a point *e*, where also the bottom of the cavity D would end. 60 65 70 75 80

The means that I have just indicated apply as well where the hollow body of the projectile, made of hard metal, as in Fig. 7, is placed on a form or die T, of suitable metal, and filled with a heavy metal forming core B', with a head *g* occupying recess E. Such a projectile differs from those that have been in use up to now in that what is in fact the hollow body instead of being an envelop or sheath of small thickness has a wall sufficiently thick to resist all deformation during the movement of the projectile in the bore. 85 90

I claim as my property in accordance with the law—

1. A projectile consisting of a cap and base connected by a central bar or core, all made of a hard metal, and a sleeve or filling of heavier metal, such as lead, about said bar or core between the cap and base and of less diameter than said parts. 95 100

2. A projectile consisting of a cap and base connected by a central bar or core, all made of hard metal, said bar or core having projections thereon, and a sleeve or filling of heavier metal, such as lead, about said bar or core between the cap and base and of less diameter than said parts. 105

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

JACQUES LUCIANI.

Witnesses:

EDWARD P. MACLEAN,
EDWARD BEUGNIOT.