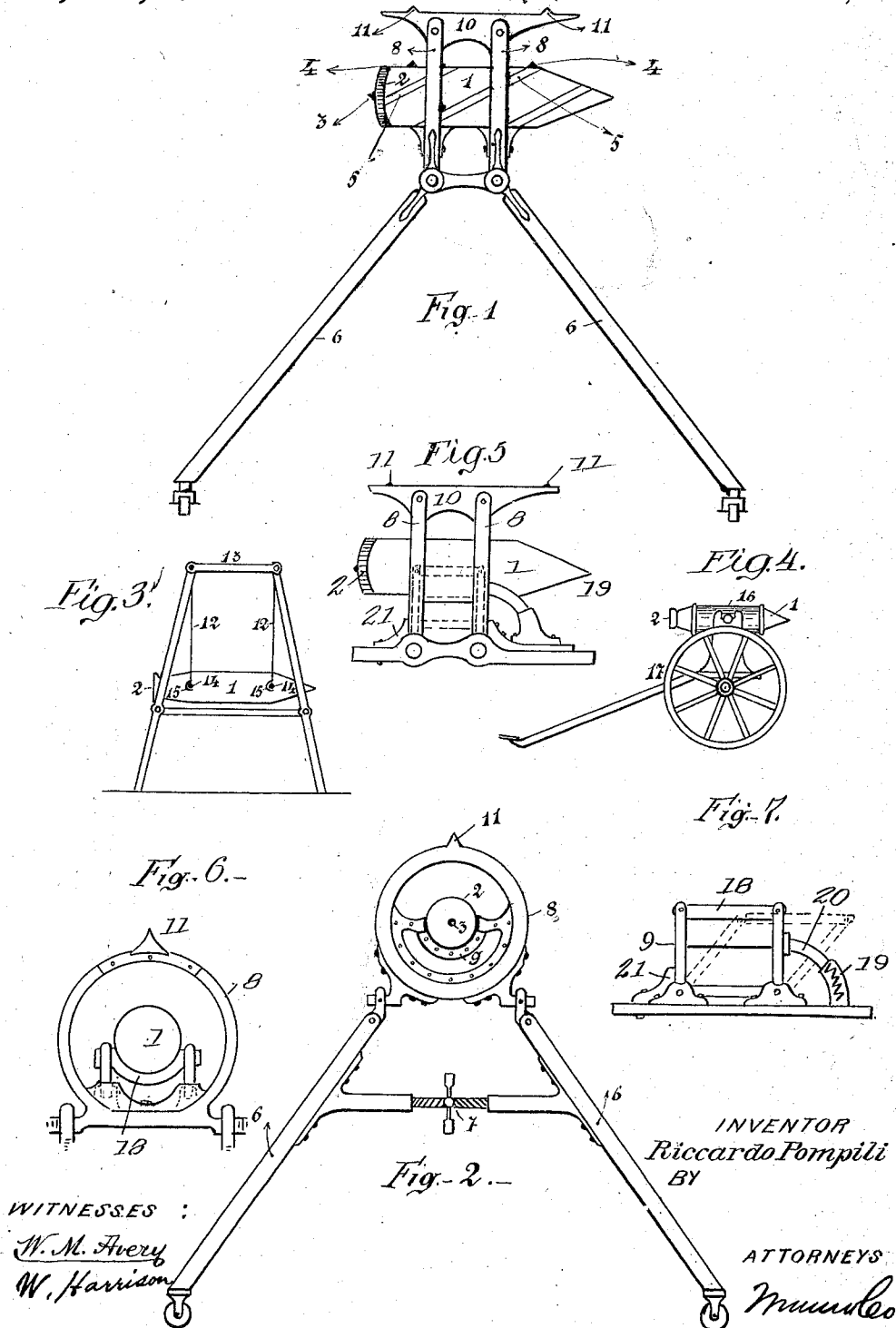


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PROJECTILE AND METHOD OF FIRING THE SAME.
APPLICATION FILED JUNE 13, 1908.

1,045,075.

Patented Nov. 19, 1912.



UNITED STATES PATENT OFFICE.

RICCARDO POMPILI, OF VILLINO ARNALDI, TIVOLI, ITALY.

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1,045,075.

Specification of Letters Patent.

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Application filed June 13, 1908. Serial No. 438,293.

To all whom it may concern:

Be it known that I, RICCARDO POMPILI, a subject of the King of Italy, and resident of Villino Arnaldi, Tivoli, in the Province of Rome and Kingdom of Italy, have invented a Projectile and Method of Firing the Same, of which the following is a specification.

In general practice ordnance projectiles hitherto have been shot off by placing them in the interior of a gun barrel, and by igniting behind them and in closed chambers explosive charges, in order to displace the projectiles along the barrel, in the direction of their axis. The continuous increase of the weight of the projectiles and of the distance to which they have to be fired have caused also an increase of the length of the barrel and of its thickness, so that the weight of the piece of ordnance is enormously augmented, the more so as additional devices have to be made use of for diminishing and braking the recoil.

The present invention has for its object to do away with the cumbersome and heavy gun barrel by utilizing the combined action of the high explosives, and of the resistance or inertia of the air. It is well known that the air opposes a resistance to moving bodies which increases more rapidly than their speed. This resistance becomes enormous when a large body of air must be displaced instantaneously, as it happens in consequence of the deflagration of a charge of high explosive, which during the combustion produces a volume of gases about 10,000 times greater than that of the unburnt charge. In such case the air opposes to the displacement a resistance almost like to that of a solid body and therefore a projectile can be shot off by simply causing to explode behind it a suitably applied charge of high explosive. It will be understood that the gases developed will at the same time tend to displace the mass of surrounding air and push against the base of the projectile, which, through the conformation of its head meeting with little resistance in the air, is thrust violently forward. As the charge during the explosion acts in the direction of the axis of the projectile, by resting the latter upon a suitable guide or support, it can be thrown in any direction desired as is the case with the ordinary guns. This way of firing shells can be usefully employed in many circumstances in which discarding

the piece of ordnance obviates many practical difficulties and in some cases it is the only course which can be practically adopted. For instance on bad grounds in high mountains it enables the artillery to reach places which could not be approached up till now; in the operations of siege it avoids many of the difficulties of transporting the heavy guns and in any case it allows of the locality being quickly abandoned without leaving behind the heavy pieces and gun-carriages which would be lost. Still more important is the use of this method on board of dirigible air ships in which it is impracticable to carry pieces of ordnance. And it is not only useful for fighting against other dirigible air ships, viz., for firing projectiles in horizontal directions, but also for firing projectiles downward, when it is not possible or convenient to cause the airship to reach the height necessary for giving to the projectile the required velocity, or when it is desired to reach a greater velocity than that which the projectile would naturally attain when falling under the combined action of its weight and the resistance of the air. This increase of velocity of the falling projectiles will become indispensable when it will be necessary to fire downward real projectiles capable of piercing through and destroying horizontally disposed armor plates which will be erected as protection against attacks from above. Lastly this method for firing projectiles can also be usefully applied for throwing safety ropes to stranded ships and in other similar cases.

From the foregoing it will be apparent that the invention can be advantageously applied in many different cases, and there are also many different ways in which the same can be carried out and, therefore the illustrations of the annexed drawings are given only by way of example and do not show all the possible forms of execution.

Figures 1 and 2 show a side and rear end view of an apparatus of this kind. Figs. 3 and 4 different ways in which the projectile may be supported. Figs. 5, 6, and 7 are details of a particular form of support for the projectile.

Behind the projectile —1— which has the shape of common projectiles, is the charge of the high explosive —2— screwed on or fixed in any other way to the base of the projectile; the charge is provided with a fuse —3— disposed on the rear free surface of

the explosive so that the combustion of the latter starts from said rear surface and progresses toward the base of the projectile. The shape of the charge is preferably a biconvex lenticular one, without sharp edges and, therefore, the base of the projectile has the shape of a spherical cavity wherein the charge fits exactly. The charge can be kept separate from the projectile and applied only in the last moment or the same can be permanently connected with the projectile thus forming a complete cartridge.

On the surface of the projectile two sights —4— are applied and further its surface is either provided with helical grooves —5— or with projecting ribs of the same shape, the aim of which is to cause the projectile to revolve.

In the way of carrying out the invention shown in Figs. 1 and 2 the projectile is supported by a trestle having four legs —6— in which the position of the legs is regulated by means of a double span-screw —7—. Two rings —8— mounted above the head of the trestle carry the supports —9— in which the projectile is resting. Upon a cross-piece —10— which joins together the rings —8— are two sights —11— which serve for sighting in case outer sights are not disposed on the projectile itself.

In the example shown in Fig. 3 the projectile —1— is seen suspended by means of ropes —12— from a trestle —13— of somewhat different construction. The projectile is provided with lateral pivots —14— which engage in hooks —15— disposed in such a way as to allow of the free departure of the projectile at the moment of the explosion of the charge.

Lastly the form represented in Fig. 4 shows how for guiding the projectile a short barrel —16— mounted upon a gun-carriage-like support —17— can be made use of. The barrel will be rifled for conferring upon the projectile the usual rotation. It has to be borne in mind that the barrel —16— has not to resist the explosion of the charge as it takes place outside the same.

Apparatus of this kind have no recoil because the reaction is supported by the surrounding mass of air; but instead of a recoil the friction of the projectile on its supports causes at the moment of the explosion a forward pull, which is perceptible in apparatus of the kind illustrated in the Figs. 1, 2 and 4.

This shock can be prevented by adopting hinged supports —9— as those shown in the Figs. 5, 6, 7. The cradle —18— whereon rests the projectile forms together with the two supports —9— a parallel motion device which at the moment of the explosion is shifted forward, taking the position shown by dotted lines in the Fig. 7, and is braked in its motion by the spring —19— upon which acts the bent arm —20—. After the projectile has been fired, the spring —19— brings the device back into its original position, where it is stopped by fixed catches —21—.

In the case of projectiles fired by dirigible airships care has to be taken that the explosion of the charge does not take place in the proximity of the gas bag. Therefore, when firing the projectiles downward a time fuse of any construction will be provided which produces the explosion of the charge when the projectile has reached a given distance. In the case however of projectiles fired in horizontal direction against other airships for instance, it will be convenient to throw the projectile by means of a cross bow or any other similar device sufficient for projecting it to a distance at which the charge which impresses upon it the necessary impulse for bringing it at the mark can be safely exploded.

I claim—

1. A method for firing a projectile with conoidal point without employing any fire-arms and combustion chambers, consisting in disposing the projectile with conoidal point before its starting freely in the air, supported in any way, with its axis directed toward the target, in freely applying against its rear face a charge of high explosive, and in bursting this charge.

2. A cartridge designed to fire a projectile with conoidal point without employing any fire-arms and combustion chambers, comprising a projectile with conoidal point, a charge of a high explosive freely applied against its rear face and sights fixed on the lateral surface of the projectile.

In testimony whereof I have signed my name in the presence of two subscribing witnesses.

RICCARDO POMPILI.

Witnesses:

LEFFERN LABOCIETTO,
A. RAZZI.