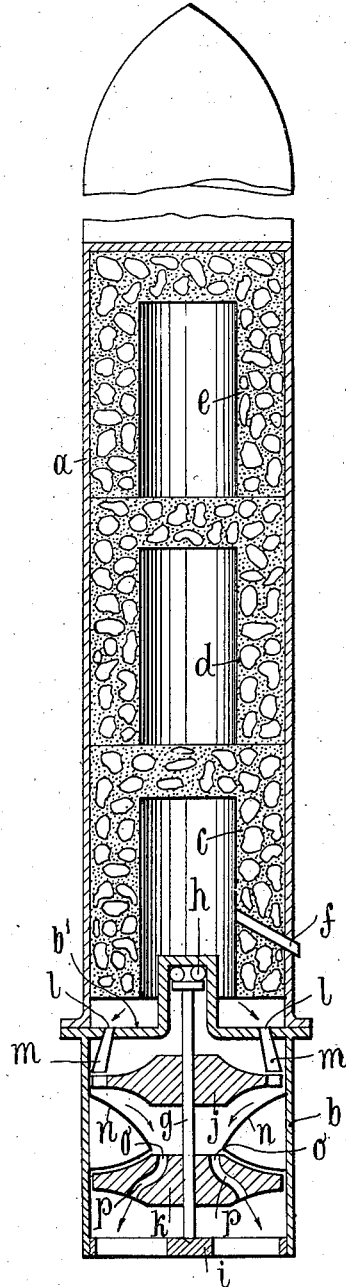


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GYROSCOPIC ROCKET.  
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976,732.

Patented Nov. 22, 1910.



Witnesses:  
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# UNITED STATES PATENT OFFICE.

NICOLAS GHERASSIMOFF, OF ST. PETERSBURG, RUSSIA.

## GYROSCOPIC ROCKET.

976,732.

Specification of Letter's Patent. Patented Nov. 22, 1910.

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*To all whom it may concern:*

Be it known that I, NICOLAS GHERASSIMOFF, a subject of the Czar of Russia, residing at 41 Liteiny Prospekt, in the city of St. Petersburg and Empire of Russia, have invented new and useful Improvements in Gyroscopic Rockets, of which the following is a specification.

The object of the present invention is to use the recoil and energy of the gases produced by the combustion of explosives to project objects into the air, an impulse in the desired direction being given to them during a certain interval of time. The object projected is, at the same time, given stability in the air by means of masses provided within the said object which revolve at a high speed about an axis parallel to the direction of motion.

The accompanying drawing shows by way of example a longitudinal section on the axis of a gyroscopic rocket constructed according to the present invention.

The rocket consists essentially of two cylindrical casings *a* and *b* of sheet-steel which are placed end to end. The casing *a* contains cylinders *c*, *d*, *e* of compressed powder or other slow-burning explosive. In order to expose the surface necessary for the formation of a large quantity of gas at the moment of explosion, which latter is started by the firing *f* in any suitable manner, the cylinders *c*, *d*, *e* are hollowed out for the greater part of their height as indicated in the drawing the number of these cylinders, which burn one after the other, depends on the length of time the explosive is required to burn.

The casing *b* which is fastened to the casing *a* by means of clamps, bolts, screws or other suitable means, is separated from it by a cover *b'*, and contains a shaft *g* one end of which is supported, in order to reduce frictional resistance, by a ball bearing, *h*, mounted in a cage or socket formed in the cover *b'*. The other end of the shaft is supported by a bearing *i*, which is held central in the end of the casing *b* by means of a number of radial arms connecting it to the circumference of the said casing.

Two wheels *j* and *k* are keyed upon the shaft *g*. The wheel *j* is constructed in the form of a Pelton wheel or other turbine wheel and constitutes the driving wheel of the gyroscopic system. The wheel *k* is the propulsion wheel. The driving wheel *j* is

an essential and necessary part of the system while the wheel *k* could be replaced if desired by the blades of a screw propeller.

The apparatus acts as follows: The gas liberated by the combustion of the explosive (cylinders *c d e*) rushes out at a high velocity through the holes *l* provided in the bottom of the cover *b'* and produces the recoil pressure of the rocket, being then directed by the guide-pieces *m* onto the vanes of the driving wheel *j* to which it imparts a high rotative speed. This rotation is transmitted by the shaft *g* to the propulsion wheel *k*. The gases leave the wheel *j* with a lower velocity than that with which they entered it, and are then directed by the guide surfaces *n*, to openings *o* in the wheel *k* which are formed close to the axis of the latter. The gases pass through passages *p* in this wheel, and since these passages open at a point on the other side of the wheel nearer the circumference than the openings *o*, the gases leave this wheel *k* with a higher velocity than they had when entering the openings *o*, but with a lower velocity than their initial velocity when entering the wheel *j*. It is evident that, by thus increasing the velocity of the gases, the wheel *k* receives an impulse from the gases in the direction of motion of the rocket and communicates it to the latter thereby increasing the action of the recoil. On the other hand the rapid rotation of wheels *j* and *k* gives the rocket the desired stability in the air. The objects to be carried by the rocket are placed at its head.

It will be understood that the invention is not strictly limited to the exact arrangement described above and illustrated in the drawing, for it is evident that certain modifications could be made in the detailed construction of the various constituent parts of the system, such as might be shown in practice to be advantageous or necessary, without departing from the spirit of the invention.

I claim:

1. In a gyroscopic rocket, the combination of an explosive charge; a gyroscopic device comprising a driving and a propelling wheel, carried by said rocket and adapted to give stability to said rocket during flight; and means for leading the gases evolved from said charge to said gyroscopic device for the purpose of rotating the same, substantially as described.

2. In a gyroscopic rocket the combination

of an explosive charge; a driving wheel adapted to receive the gases evolved from said charge; a propelling wheel driven from said driving wheel and provided with means  
5 for increasing the velocity of the gases received from said driving wheel said wheels being of sufficient weight to constitute a gyros-  
10 coping device adapted to give stability to said rocket during flight; and means for igniting said charge, substantially as described.

3. In a gyrosopic rocket, the combination of an explosive charge; a casing containing said charge; a driving wheel adapted to receive the gases evolved from said charge;  
15 a propelling wheel driven from said driving

wheel and provided with means for increasing the velocity of the gases received from said driving wheel, said wheels being of sufficient weight to constitute a gyrosopic  
20 device adapted to give stability to said rocket during flight; a second casing having perforations for the escape of gases, containing said wheels; a shaft mounted in said  
25 second casing carrying said wheels; and means for igniting said charge, substantially as described.

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Witnesses:

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