The present invention has for its main object a contrivance or device for throwing projectiles or the like for any applications, but particularly, for navigation and salvage purposes, as well as for throwing fireworks of any nature.

This contrivance or apparatus may more particularly be so devised as to constitute a grappling rope thrower and comprises in this case the combination of a tubular projectile, constructed for fitting over a guide easily adjustable in position, with means for throwing the said projectile, and with a stress-limiting and securing system for the end of a grappling rope, suitably coiled for offering the minimum of resistance to unwinding.

This invention thus defined can give rise to a large number of constructional modifications which can differ from each other:

(a) By the constitution and the shape of the tubular projectile, which may be of any type whatever, and variable according to circumstances and applications. It is however specifically indicated, on the one hand, that for the application to salvage purposes, it will be necessary to devise this projectile in such a manner that it can float on water and, on the other hand, that the invention, by way of new industrial product, includes in its scope a hollow projectile of this type or comprising a casing of small density forming a buoy or a float.

(b) By the constitution and the shape of the guide on which fits the projectile, and which can also be of any kind.

(c) By the means used for ensuring the pointing of this guide, which means may be extremely variable. Thus, in case the device is used on land, the guide can be provided with a simple spade bearing on the ground, the guide being orientated by hand, and, particularly in case the device is used on board a ship, the guide can be horizontally pivoted on a vertically pivoted carriage, which will carry a box in which will be coiled the grappling rope.

(d) By the means for throwing the projectile, which means can be borrowed from the energy of a compressed or liquefied gas, or again from that of various explosives. In this latter case, the projectile can be thrown either as the projectile of a piece of ordnance, or as a rocket.

(e) By the stress-limiting means securing the grappling rope to the projectile, which means can, for instance, utilize springs of any type and, preferably, coil springs of variable flexibility, but any stress-limiting means can be used, so as to avoid the rupture of the grappling rope by the rough pull exerted, upon starting, by the projectile, and it is not necessary that these means should utilize springs, although the use of these latter seems to be particularly practical.

The invention includes also in its scope improved means relating to pyrotechnical projectiles, for allowing to efficiently throw the latter, by the explosion of a cartridge integral with the same and struck by the mechanism of the throwing device.

These means comprise:

(a) A tube perforated with vent holes and provided with gills, secured on the distortable bottom of the firework and adapted to receive a central percussion throwing cartridge.

(b) In the particular case of the grappling rope thrower, a mortar substantially constituted by an internally calibrated tube and provided, at one of its ends, with an internally threaded portion for screwing on the threaded end of the grappling rope thrower, the striker of which is used for striking the cartridge of the firework when the latter is placed in the mortar.

It is to be understood that the invention includes in its scope all the constructional modifications of the above mentioned devices, all their modes of execution, and all their applications.

The accompanying drawings illustrate, by way of example only, a form of carrying out the invention.

Figure 1 is an elevation of the entire structure.

Figure 2 is a sectional view, the carriage being omitted.

Figure 3 is a sectional view made according to line III—III of Fig. 2.

Figure 4 is a section made according to line IV—IV of Fig. 2.
Figure 5 is an elevation without the carriage, the cocking socket being in section. Figure 6 shows in elevation, with partial section, an improved firearm. Figures 7 and 8 are respectively an elevation and a plan view of the tube adapted to receive the cartridge for throwing the firework. Figure 9 is an axial section of the mortar secured on a grappling rope thrower and containing the firework to be thrown.

In the example illustrated in Figs. 1 to 5, are to be found the main following members, the new combination of which forms, as stated, the main part of the invention:

The tubular projectile 1, the bore 1' of which is closed at one end; this projectile is provided, on the side of the orifice of the bore 1', that is to say at the tail end, with lugs 1° for attaching the grappling rope. The latter thus stabilizes the projectile on its trajectory.

The guide 2 for the projectile 1, which fits over this guide; in the example illustrated, the guide 2 is horizontally pivoted at 2° on a carriage 2' which can rotate about a vertical axis and carries a box 2° in which is coiled the grappling rope.

The means for throwing the projectile 1, which means substantially comprise an explosive charge arranged at the end of the guide 2; and a striker 3 for determining the explosion of this charge, through the means hereinafter described.

The striker 3 is placed at the end of the guide 2, and is held in its rear position by a spring 3° interspersed between the striker 3 and the stop nut 2°. A rod 3°, guided in the inner bore of the guide 2, serves to actuate the striker when it receives the impulse of a cock 3° movable in the tail member 3°. A spring 3° is interspersed between this cock 3° and the bottom of the tail member; a cocking socket 3° allows to pull the cock 3° backward for cocking it in combination with a detent 3°, subjected to the action of the spring 3°.

The cocking socket 3° is provided with a rod 3° which enters a long hole 3° in the slide-block 3° and can also enter radial slots 3°a and 3°b, for constituting a safety device.

The stress-limiting and securing system, between the grappling rope and the projectile 1, constituted, in the example shown, by a conical coil spring 4, that is to say having a variable flexibility, so that the pull exerted on the grappling rope when the projectile starts on its trajectory should be progressive and avoids the rupture of the said grappling rope.

The grappling rope 5, coiled in the box 2°, but which might also be coiled on the ground. The operation is as follows:

The explosive charge contained in a shortened hunting cartridge is placed in a cartridge-carrier 3°, perforated with holes, which is secured at the end of the guide, or fits over the guide 2 of the projectile 1. The grappling rope 5, suitably coiled, is attached to the spring 4.

The cocking socket 3° is then slightly rotated on its axis for coming out of the slot 3°; it is then pulled backwards, thus drawing along the cock 3° and stretching the spring 3°. When opposite the slot 3°, the cocking socket 3° is turned for entering the said slot, the cock 3° hooks over the detent 3°.

The apparatus is in the "cocked" position, with a safety means realized by the engagement of the rod 3° into the slot 3°.

The apparatus is then suitably pointed in the direction of the objective.

The firing is effected by bringing forward the cocking socket into the slot 3°, that is to say in the firing position; then, by pressing on the detent 3°, thus releasing the cock 3°.

The latter, pushed by the spring 3°, strikes against the rod 3° which pushes the striker 3. The charge explodes and the projectile is fired, drawing along the grappling rope and carrying the end of the same to destination.

In the example of Figs. 6 to 9, the firearm to which are applied the improvements forming the subject-matter of the invention is of a current design having the general shape of a cylinder centrally recessed at its base for receiving a primed time cartridge 7 for the ignition of the pyrotechnical substances contained in the body of the firearm when the latter is at the top of its trajectory.

A cup 8, made of tin plate for instance, the bottom of which is internally reinforced by a disc 9 made of a soft metal such as lead, fits over the firearm at its base and bears on the latter through the middle of a washer 10 and of a disc 11 provided with a central point 12 or striker for the primer 7.

In accordance with the invention, a steel tube 13 provided with a flange 14 and gills 15 (Figs. 7 and 8) is secured through the flange on the cup 8 by means of small nails which pass through perforations 16 of the flange 14, discs 9 and 11 and washer 10 and enter the wooden part 17 of the firearm.

The tube 15 is provided with vent holes 18 and receives a throwing cartridge which may be a hunting cartridge loaded with balistite.

The mortar is constituted by a steel tube 19 (Fig. 9) internally calibrated and fitting through a flange 20, on the end of the guide 21 of the apparatus. The mortar 14 is screwed through an internally threaded central portion of its bottom 22 on the externally threaded portion 23 of the guide 21 and locks on the shoulder 24.

The firework of Fig. 6, is introduced in the tube 19 in which it fits through the flange of the cup 8; it is pushed in until the bottom of the cartridge previously introduced in the tube 13, rests on the end of the guide 21 cen-
trally perforated for the passage of the striker.

When the cartridge is struck, the deflagration distorts the lead disc 9 and the point 12 strikes the primer 7 of the time cartridge.

The gases produced by the explosion of the cartridge escape at the same time through the vent holes and enter the mortar for driving out the firework from the latter, as well as the tube 13 and the case. The firework rises in the air whilst the time or delay cartridge burns for determining its operation at the top of its trajectory.

The new industrial products constituted by improved fireworks are not necessarily in agreement with the example of construction illustrated in Figs. 6, 7 and 8. They may differ from each other particularly:

By the mode of action of the cartridge on the striker for the primer of time or delay cartridge.

By the constitution of the cartridge-carrying tube 13 and of the means for securing the latter on the firework. The tube might, for instance, be deprived of gills, although experience has shown that these latter are advantageous.

These new industrial products, particularly remarkable in that they are driven out from the mortar with the throwing cartridge, are, whatever may be their constructional arrangements, included in the scope of the invention.

What I claim as my invention and desire to secure by Letters Patent, is:

1. In a projectile throwing device, the combination with a body of a propelling charge chamber at the forward end of said body, striking means for said propelling charge within said body, control means for said striking means at the rear end of said body, a sliding socket on said body adapted to be partially rotated and safely locked at either end of its travel.

2. In a projectile throwing device, the combination with a body of a floating hollow projectile supported by said body, a propelling charge chamber, at the forward end of said body, striking means for said propelling charge within said body and control means for said striking means at the rear end of said body.

3. In a projectile throwing device, a body, a propelling charge container, means for securing said propelling charge container at the forward end of the body, means for firing the propelling charge.

4. In a projectile throwing device, a body, a perforated propelling charge container, means for detachably securing said propelling charge container at the forward end of the body, means for firing the propelling charge.

5. In a hollow projectile throwing device, a body adapted to be encased by the hollow projectile, a perforated propelling charge container, means for detachably securing said propelling charge container at the forward end of the body, means for firing the propelling charge, control means for said firing means arranged at the rear end of the body.

6. In a hollow projectile throwing device, a body adapted to be encased by the hollow projectile and having an axial bore, a propelling charge container, means for securing said propelling charge container at the forward end of the body, firing means for the propelling charge axially arranged in the axial bore of the body.

7. In a projectile throwing device, a body arranged to be encased by the hollow projectile and having an axial bore, a perforated propelling charge container, means for detachably securing said propelling charge container at the forward end of the body, firing means for the propelling charge arranged in the axial bore of the body, control means for said firing means arranged at the rear end of the body.

8. In a hollow projectile throwing device, a body having a screw threaded forward end, a perforated propelling charge container adapted to be screwed onto said forward end of the body, means for firing the propelling charge.

9. In a projectile throwing device, a body adapted to be encased by the hollow projectile and having peripheral grooves, a perforated propelling charge container, means for detachably securing said propelling charge container at the forward end of the body, means for firing the propelling charge.

10. In a projectile throwing device, an axially bored body having peripheral grooves, a perforated propelling charge container, means for detachably securing said propelling charge container at the forward end of the body, striking means in the axial bore of the body for firing the propelling charge, an enlarged part on the said striking means to prevent the combustion gases to enter the axial bore of the body.

11. In a projectile throwing device, a body, a propelling charge container, means for securing said propelling charge container at the forward end of the body, means for firing the propelling charge, a support, means for horizontally pivoting the body on the said support.

12. In a projectile throwing device, a body adapted to be encased by the hollow projectile, a propelling charge container, means for securing said propelling charge container at the forward end of the body, firing means for the propelling charge, a support, means for horizontally pivoting the body on the said support, a carriage, means for vertically pivoting the support on the said carriage.
13. In a projectile throwing device, the combination with a body of a perforated combustion chamber for the propelling charge, said chamber being detachably fixed at the forward end of said body, control means for said striking means near the rear end of said body, a vertically pivoted support on which the body is horizontally pivoted and a balance weight mounted on the rear end of the body and adapted to facilitate aiming.

In testimony whereof I have signed my name to this specification.

JEAN FREDERIC JULES REIBEL.