E. A. L. ROBERTS.

Torpedo for Oil-Wells.

No. 200,570. Patented Feb. 19, 1878.

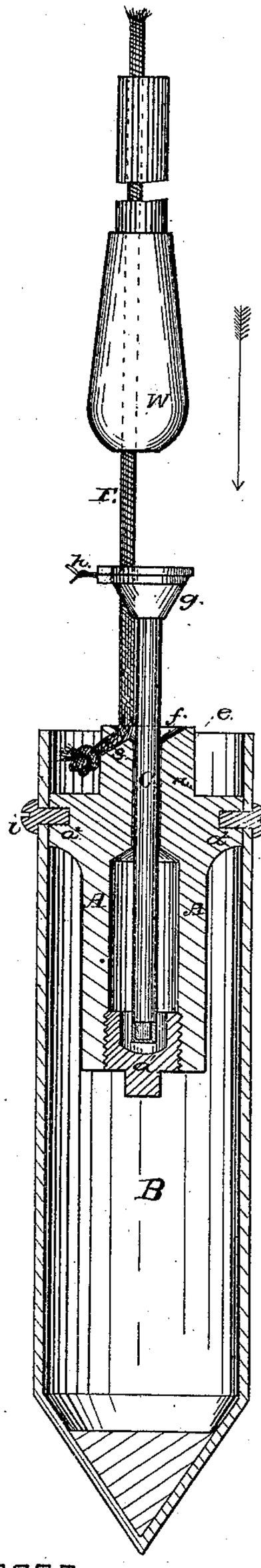

Fig. 1.

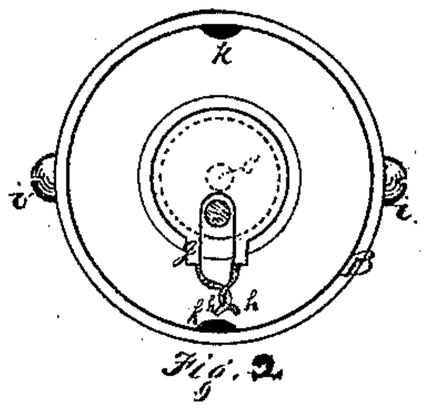

Fig. 2.

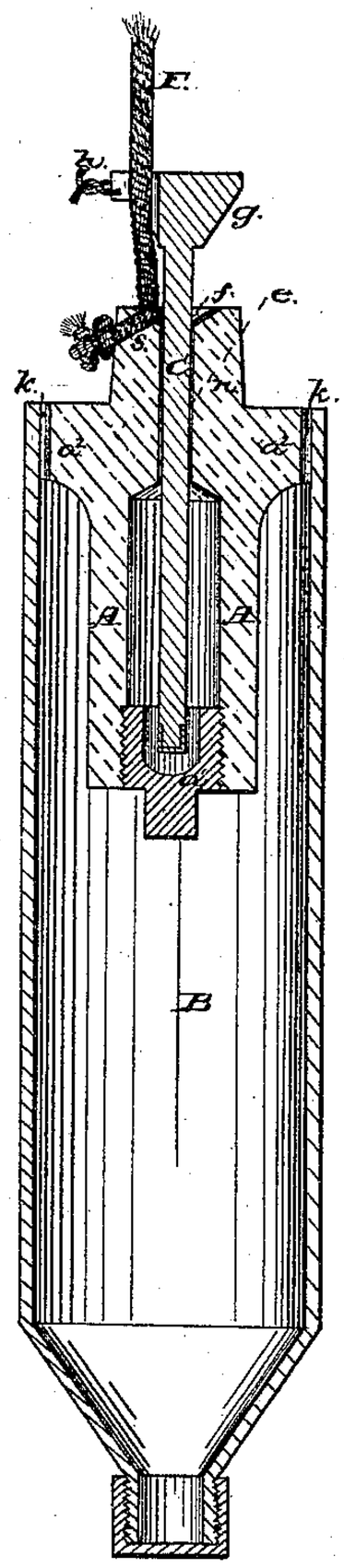

Fig. 3.

Witnesses.

D. F. Patterson

Wesley Green

Inventor

Edward A. L. Roberts

UNITED STATES PATENT OFFICE.

EDWARD A. L. ROBERTS, OF TITUSVILLE, PENNSYLVANIA.

IMPROVEMENT IN TORPEDOES FOR OIL-WELLS.

Specification forming part of Letters Patent No. **200,570,** dated February 19, 1878; application filed October 7, 1875.

To all whom it may concern:

Be it known that I, EDWARD A. L. ROBERTS, of Titusville, in the county of Crawford and State of Pennsylvania, have invented a new and useful Improvement in Torpedoes; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawing, in which—

Figure 1 is a view of devices embodying my invention, partly in section and partly in elevation. Fig. 2 is a top view of the priming-chamber and percussion-rod. Fig. 3 is a central section of the torpedo.

Like letters refer to like parts wherever they occur.

My invention relates to the construction of torpedoes, more especially adapted for torpedoing oil and other Artesian wells; and has for its object to cheapen and simplify their construction, render them more certain in their discharge, and more safely charged and handled; to which end it consists in such a construction of the priming-chamber and percussion-rod or firing devices that the initial exploding-charge and the firing devices can be added and adjusted immediately before lowering the torpedo into the well, and after it has been secured to the rope or other means employed for lowering the torpedo.

It also consists in so constructing the initial or priming chamber and firing devices that the initial explosion occurs within the priming-charge, and cannot be affected by exterior causes; and, also, in features of construction which facilitate and render more safe the charging of the priming-chamber.

Owing to the extreme danger of transporting nitro-glycerine in bulk by rail or otherwise, the universal practice is to ship the empty torpedo-cases to the desired point, to transport the nitro-glycerine in limited quantities by wagons or hand, and to charge the torpedo when and where used. Consequently the charging of the torpedo is frequently entrusted to unskillful, incompetent, and ignorant parties, giving rise to much danger where a complicated torpedo is employed.

It is well understood that great advantages arise in nitro-glycerine torpedoes if the initial explosion be powerful; but owing to the attendant danger of charging the priming-chamber with powerful explosives, the less powerful (and less dangerous) gunpowder is commonly employed for safety's sake, with proportionate sacrifice of results. A great disadvantage, also, of employing gunpowder or like explosive is that, should the charge of the priming-chamber become damp from liquid in the well, as frequently happens, the torpedo fails to explode, necessitating its withdrawal, which increases the risk incurred.

I will now proceed to describe my invention, so that others skilled in the art to which it appertains may apply the same.

In the drawing, A indicates the priming-chamber; B, the body of the torpedo; F, the cord or wire for lowering the torpedo; and W the weight for discharging the torpedo. The body B may be of the form shown, slightly tapering, or of any other approved form which will contain the main body or charge of nitro-glycerine employed, is closed below, and has secured within its open end the priming-chamber A by bolts, screws, rivets, or other suitable means.

A indicates the priming-chamber, which is a heavy metal hollow cylinder, usually of cast metal, closed at one end, with the exception of a central orifice, *e*, sufficiently large for the passage of a small percussion or firing rod, the opposite end being tapped or threaded internally for the reception of a screw-plug, a^1, which converts the cylinder into a closed chamber of considerable strength.

The plug a' or bottom of the chamber serves as an anvil, on which to explode the fulminate; but, if preferred, a projection or anvil may be formed at a point higher up in the chamber A, so as to be nearer the center of the priming-charge. As the chamber is preferably produced by casting, it can be more readily and cheaply made by casting one end open and finishing it with a plug, as specified. Upon the chamber, opposite the screw-plug a^1, is a flange, a^2, of such width as will fill up the open end of the body B, or space between it and the chamber A, said flange being notched at one or more places, *k*, to permit of the filling of the body of the torpedo after the priming-chamber has been secured thereto. Lugs or projections *i* serve as means for riveting the body and priming-chamber together. On the upper end of chamber A is a neck or projec-

tion, *n*, through which extends rod-orifice *e*, said projection being cupped, as at *f*, to facilitate the filling of the priming-chamber through *e*, and perforated, as at *s*, to give attachment to the cord or wire by which the torpedo is lowered into the well.

C represents a rod for exploding the fulminate within the priming-chamber A. This rod is usually about four inches long, or such length as will reach the anvil within the priming-chamber, and of such diameter (usually one-fourth inch) as will pass easily within aperture *e*. It is furnished above with an expanded head, slotted, as at *g*, to admit the wire or cord by which the torpedo is lowered, and is provided with light wires *h h*, by means of which the rod can be secured to the lowering-cord. The lower end of the rod is adapted to receive a cap; but other means of securing the fulminate to the end of the rod or within the priming-chamber, so as to explode it in the priming-charge, may be adopted, if preferred.

With such or a similar torpedo I employ a priming-charge of nitro-glycerine, or similar explosive not effected by water or other liquid which may be in the well, and which can be readily introduced after the torpedo is ready for lowering.

The devices are charged and employed as follows: The torpedo-case is attached to the cord or other means of lowering the torpedo. The body B is then filled with the main charge of nitro-glycerine, or similar explosive, through the openings *k k* in the rim or flange a^2 of the priming-chamber. The priming-chamber is next carefully filled through orifice *e*, and finally the percussion-rod *b*, whose lower end has been furnished with a percussion-cap or other fulminate properly protected, is carefully inserted in orifice *e* until its lower end rests upon or near the bottom of chamber A, or an anvil arranged therein, when the slot *g* of the rod-head is slipped upon the lowering-cord, and secured by wires *h h*. The torpedo is now ready for lowering, and when it has reached the desired depth in the well the firing-weight W, which is slipped upon the upper end of the lowering-cord, is permitted to fall, striking the head of the percussion-rod, and exploding the fulminate within the priming-chamber.

The initial force and heat engendered by the explosion of the fulminate explodes the priming-charge, which, being confined by a strong chamber, accumulates force sufficient to explode the main charge to the greatest advantage, when the priming-chamber bursts and delivers the blow or shock to the main charge.

The advantages of my invention are simplicity of construction, whereby first cost of case is materially reduced; simplicity in charging, whereby the risk of handling and using is materially reduced, no connection between the parts of the torpedo having to be made after it is charged, excepting the simple introduction and securing of the percussion-rod; the dispensing with water-proof coatings, &c., heretofore required to protect the priming of powder, &c., employed; and, finally, the certainty with which the torpedo can be exploded.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. The combination, with the body of a nitro-glycerine torpedo, of a priming-chamber for containing a priming-charge of nitro-glycerine, and devices, substantially as described, for exploding a fulminate within the priming-chamber, so as to apply the initial force within the body of the priming-charge, substantially as specified.

2. The priming-chamber for torpedoes, for containing nitro-glycerine, having the orifice for introducing the percussion-rod, and through which the priming-chamber may be charged, in combination with a percussion-rod, adapted to explode a fulminate within the priming-chamber, substantially as and for the purpose specified.

3. The combination, with a torpedo-body, B, of the priming-chamber A, having the notched flange a^2, the filling and percussion-rod orifice *e*, with funnel-mouth *f*, and the percussion-rod having the slotted wired head, the whole constructed substantially as and for the purpose specified.

In testimony whereof I, the said EDWARD A. L. ROBERTS, have hereunto set my hand.

EDWARD A. L. ROBERTS.

Witnesses:
R. G. BAILEY,
W. L. YELTON.