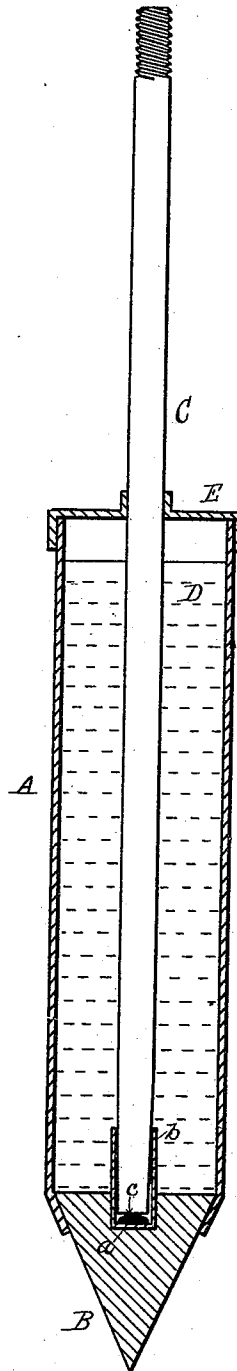


(No Model.)

W. RAMSDEN.
MEANS FOR EXPLODING TORPEDOES.

No. 470,705.

Patented Mar. 15, 1892.



Witnesses:
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UNITED STATES PATENT OFFICE.

WILLIAM RAMSDEN, OF BUXTON, NORTH DAKOTA.

MEANS FOR EXPLODING TORPEDOES.

SPECIFICATION forming part of Letters Patent No. 470,705, dated March 15, 1892.

Application filed May 9, 1891. Serial No. 392,196. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM RAMSDEN, of Buxton, in the county of Traill and State of North Dakota, have invented certain new and useful Improvements in Torpedoes, of which the following is a specification.

The present invention is primarily designed to be utilized in connection with the sinking of oil and Artesian wells. In sinking such wells rock is very frequently encountered which cannot be penetrated by the usual boring or drilling instruments, and in such cases further progress can only be made by shattering the obstructing rock—as, for example, by exploding a torpedo at the bottom of the well. As hitherto conducted, the process of so exploding a torpedo in well-boring has been attended with considerable difficulty and danger. The means which have been commonly employed with a view to properly effecting the explosion have been difficult to manage, especially in that it is difficult to insure the torpedo being in contact with the rock to be shattered at the instant of the explosion. Furthermore, there is danger of totally destroying the well-casing itself as the result of premature explosion of the torpedo. Consequently it has often been the case that when rock is encountered in the sinking of a well the well is abandoned and started in a new locality rather than accept the risk attendant upon the explosion of torpedoes, according to the commonly-employed methods.

Now the special object of the present invention is to provide efficient and convenient means for removing rocks encountered during the process of sinking wells; and to this end the invention consists in an improved construction and arrangement of the firing instrumentalities for effecting the explosion of a torpedo at the bottom of a well.

The method of exploding a torpedo contemplated by the present invention consists in bringing it forcibly in contact with the rock at the bottom of the well, thus firing a fulminate carried by the torpedo, and so arranged between and in contact with two relatively-immovable parts thereof that it will be fired by the concussion produced by forcing the torpedo against the rock.

The detail construction and arrangement of parts constituting the invention are illus-

trated in the accompanying drawing, which shows in vertical longitudinal section a torpedo constructed in accordance with the present improvements.

Referring to the drawing, A is the cylindrical outer casing of the torpedo, which is conical at its lower end, as shown. The conical lower end B of the casing is a solid piece of metal, which is firmly joined to the cylindrical portion of the casing and closes the lower end thereof, constituting the lower extremity or point of the torpedo. The conical extremity B of the casing is provided at the center of its upper surface with a cylindrical chamber or cavity *a*, into which is placed a firing-cap *b*, having a suitable fulminate *c* at its bottom. The cap *b* rests on the bottom of the cavity *a*, and it is held in contact therewith by a rod or needle C, which is introduced from the top of the casing A. The rod or needle C enters the cap and rests on the top of the fulminate, so that the fulminate is firmly held by and between the end of the rod or needle C and the solid metal which constitutes the bottom of the cavity *a*. Preferably the lower end of the rod or needle C is made slightly tapering, so as to facilitate its insertion into the cap *b*, and its upper end extends up beyond the top of the casing. When the rod or needle has been properly inserted, so that its lower end is in contact with the fulminate, nitro-glycerine or other explosive D is introduced into the interior of the casing A and is filled in around the rod or needle C until the casing is full. The upper end of the casing is then closed by a cap or cover E, having a central aperture through which the rod C passes. The explosive material, together with the cover E, holds the needle C in place and maintains it immovably with reference to the fulminate.

The essential and characteristic feature of the construction of torpedo just described is that the fulminate *c* is held by and between the relatively immovable parts B and C and so located that the fulminate will be fired and the explosive D exploded by simple concussion in the manner below set forth. The cap *b* is simply a convenience in construction, since it enables an ordinary cap to be used as the means of applying the fulminate to the part B.

The method by which it is proposed to effect the explosion of the torpedo is as follows: When a rock is struck in the process of boring a well, the drill-rods are drawn up and the torpedo is rigidly attached to the lower drill-rod in place of the tool with which the drilling was being done. The upper end of the rod or needle C of the torpedo is screw-threaded, so as to enable it to couple with the drill-rods. The torpedo having been attached, the drill-rods are lowered until the point of the torpedo rests firmly and securely upon the obstructing-rock. The torpedo is then in position to be exploded, the explosion being effected by striking the end of the upper drill-rod at the mouth of the well. The blow at the mouth of the well is communicated through the drill-rods and the needle C of the torpedo to the fulminate, which is exploded by the concussion, thus effecting the consequent explosion of the torpedo.

If desired, instead of exploding the torpedo by means of a blow at the mouth of the well the same result may be accomplished by dropping the torpedo from some point above the bottom of the well after a certain length of drill-rods has been attached thereto, the explosion in that case resulting from the striking of the rock by the torpedo and the momentum of the needle C and the attached drill-rods. Then after the explosion has taken place the rods may be drawn to the surface by any of the means usually employed for elevating drill-rods and sucker-rods.

It will be seen that the solid metallic extremity B of the torpedo-casing constitutes what may be called an "anvil," the fulminate being so held between the anvil B and the rod or needle C that the concussion between the torpedo and the rock is communicated to the fulminate, thus causing the explosion. The conical shape of the anvil B serves to guide the torpedo and to insure it coming in contact with the obstructing rock, since any loose earth which may rest on the surface of the rock will be penetrated by the sharp point of the conical anvil.

The method by which I provide for the explosion of the torpedo is exceedingly simple, and yet it overcomes the serious difficulties of previous and more complicated methods. By the present improved method the torpedo is exploded just at the surface of the obstructing rock, and there is no possibility of error or mistake as to the time or place of the explosion, since the explosion can only take place at the bottom of the well, and the time of the explosion is governed by the simple dropping of the torpedo or by the striking of the drill-rods at the mouth of the well. It is preferable in most cases to fire the torpedo by striking the upper drill-rod at the mouth

of the well, since by this plan the contact of the torpedo with the rock to be shattered may be satisfactorily insured before attempting the explosion. By lowering the connected drill-rods with the torpedo on their lower end the point of the torpedo can be carefully and accurately placed in contact with the rods, thus overcoming the greatest difficulty in the use of ordinary torpedoes.

There is no danger in the practice of this method of the drill-rods being thrown out of the well or of the well-casing being destroyed. The needle C extends entirely through the explosive material to the bottom of the cylinder A, so that when the explosion occurs all the forces exerted on the needle are lateral and balance each other, so that there is no upward movement of the needle and of the parts attached thereto. Consequently there is no danger to the operators at the mouth of the well.

I claim as my invention—

1. A torpedo for wells, having no independently-movable part, but having an anvil on which the fulminate of the torpedo is located, and a firing-needle in connection therewith, one end of which is held permanently in contact with the fulminate and the other end of which is adapted to be rigidly secured to a drill-rod, substantially as set forth.

2. In a torpedo, the casing A, containing an explosive, the anvil B at the bottom of said casing, and the fulminate located on said anvil, in combination with the rod or needle C, held permanently in contact with said fulminate, substantially as set forth.

3. In a torpedo, the casing A, containing an explosive, the solid anvil B, constituting the bottom of said casing and having a cavity *a* therein, and the fulminate in the bottom of said cavity, in combination with a rod or needle C, the lower end of which enters said cavity and is held in contact with said fulminate, substantially as set forth.

4. In a torpedo, the cylindrical casing A, containing an explosive, the conical anvil B, constituting the lower extremity thereof, and the fulminate located on said anvil, in combination with the rod or needle C, one end of which is held in contact with said fulminate and the other end of which extends upward through said casing and projects beyond the top thereof where it is adapted to be coupled to a drill-rod, substantially as set forth.

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

WILLIAM RAMSDEN.

Witnesses:

ARTHUR S. BROWNE,
SAML. C. MILLS.