G. S. VAUGHN.

Torpedo for Oil-Wells.

No. 200,491. Patented Feb. 19, 1878.

fig. 1.

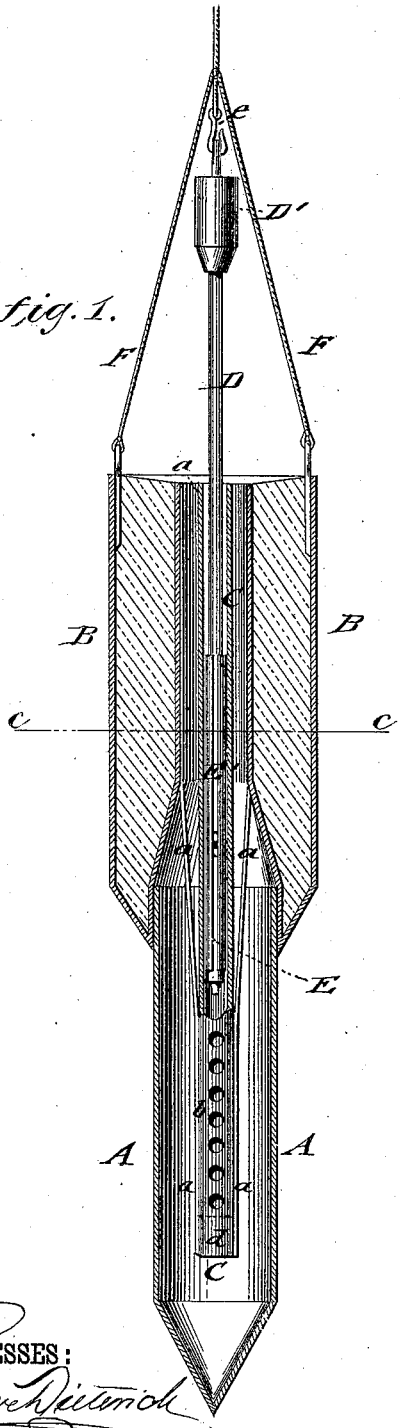


fig. 2.

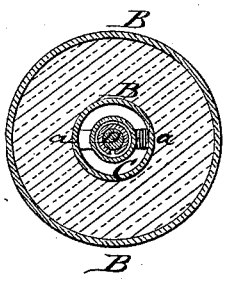
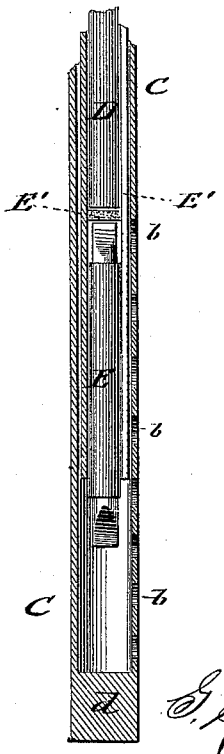


fig. 3.



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UNITED STATES PATENT OFFICE.

GEORGE S. VAUGHN, OF FRANKLIN, PENNSYLVANIA.

IMPROVEMENT IN TORPEDOES FOR OIL-WELLS.

Specification forming part of Letters Patent No. **200,491**, dated February 19, 1878; application filed January 11, 1878.

To all whom it may concern:

Be it known that I, GEORGE S. VAUGHN, of Franklin, county of Venango, and State of Pennsylvania, have invented a new and Improved Oil-Well Torpedo, of which the following is a specification:

In the accompanying drawing, Figure 1 represents a vertical central section of my improved oil-well torpedo; Fig. 2, a horizontal section of the same on line *c c*, Fig. 1; and Fig. 3, a vertical central section of the anvil, guide-tube, drop-rod, and start on enlarged scale.

Similar letters of reference indicate corresponding parts.

This invention relates to an improved oil-well torpedo that is self-tamping, and does not require any fluid or other tamping in the well. The torpedo is fired and exploded in reliable manner, and without the least danger in handling.

The invention consists of a cylindrical shell, whose upper portion is made of an outer and inner cylinder, and filled with plaster-of-paris, sand, or other tamping material. A small central tube is supported in the shell, and extended downward into the bottom part of the same. It has a solid portion or anvil at the lowermost end, and side perforations for the entrance of the nitro-glycerine. A weighted drop-rod, to which a short iron rod or "start," with percussion-caps at both ends, is attached by a ferrule, is guided in the center tube, and explodes the shell by being dropped down on the anvil.

In the drawing, A represents the lower shell, of cylindrical shape, which is soldered to the double upper shell B, that is filled with plaster-of-paris, sand, or other tamping material. The lower shell A constitutes the torpedo proper, while the upper shell, on being burst, is spread by the force of the explosion of the nitro-glycerine, and acts as a tamping by closing the well above and sending the force of the explosion into the crevices of the rock. The lower shell A is filled with nitro-glycerine through the inner cylinder or tube of the double shell, to which is attached a small central tube, C, by top and bottom stays *a*, as shown in Fig. 1. These stays hold the central tube C firmly in position.

The tube C extends down into the lower chamber or shell nearly to the bottom of the same, and is provided with small holes *b* at the lower part, inside of the shell A, through which the nitro-glycerine passes to the firing-points. At the lower or bottom end of the small center tube C is secured a solid piece, *d*, of iron, that acts as the anvil.

The torpedo is exploded by means of a drop-rod, D, attached to a weight, D′, in connection with a small iron rod, E, called a "start," that is attached to the drop-rod by means of a ferrule, E, of tin. Percussion-caps are placed on both ends of the start, so as to secure the explosion on lowering the drop.

The torpedo is suspended from a bail, F, of suitable length, made of strong twine or cord, to which the wire or cord by which the torpedo is lowered is applied. To the center of the bail is attached a small hook, *e*, of sufficient strength to carry the weight used for exploding the caps.

When the torpedo reaches the bottom of the well, the bail is slackened, and by letting the line drop the weight drops, thereby exploding caps and torpedo. This arrangement constitutes one of the main advantages of this torpedo, as it may thereby be more safely handled without danger of explosion.

It is in most torpedoes a very dangerous operation to empty a shell after failing to get an explosion, from defective caps or other causes, especially when the torpedo has to be taken out of the well to put on fresh caps. In my torpedo all that is required is to raise the same, unhook the drop-weight from the hook on the bail, take the drop-rod out, replace the caps or put in another start, replace then the drop-rod, and the shell is ready to be lowered into the well, and all danger from the handling of the nitro-glycerine is avoided. An additional advantage is the self-tamping, which is furnished as a part of the torpedo, and lowered directly therewith, so as to be in position for the explosion whenever the same occurs. This dispenses with the fluid tamping of oil-wells, and furnishes a solid tamping in more convenient form.

Having thus fully described my invention, I claim as new and desire to secure by Letters Patent—

1. An oil-well torpedo consisting of a lower portion or shell for the nitro-glycerine, of a double upper part or shell filled with tamping material, of a central perforated guide-tube, with solid bottom end or anvil, extending through lower and upper shells, and of a weighted drop-rod, substantially as and for the purpose described.

2. The combination of the lower shell or torpedo and the upper double tamping shell with a central guide-tube, suspended from the upper shell, and having perforations, and solid lower or anvil end, and with a suspended and weighted drop-rod and capped start, substantially as and for the purpose specified.

3. The combination of the perforated guide-tube, having anvil at lower end, and of a weighted drop-rod, suspended from a hook of the bail of the torpedo, with a short iron rod or start, having percussion-caps at both ends, and connected by a ferrule to the drop-rod, substantially as and for the purpose specified.

GEORGE SYLVESTER VAUGHN.

Witnesses:

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