W. H. HARPER.

Torpedoes for Oil Wells.

No. 166,986. Patented Aug. 24, 1875.

Fig. 1.

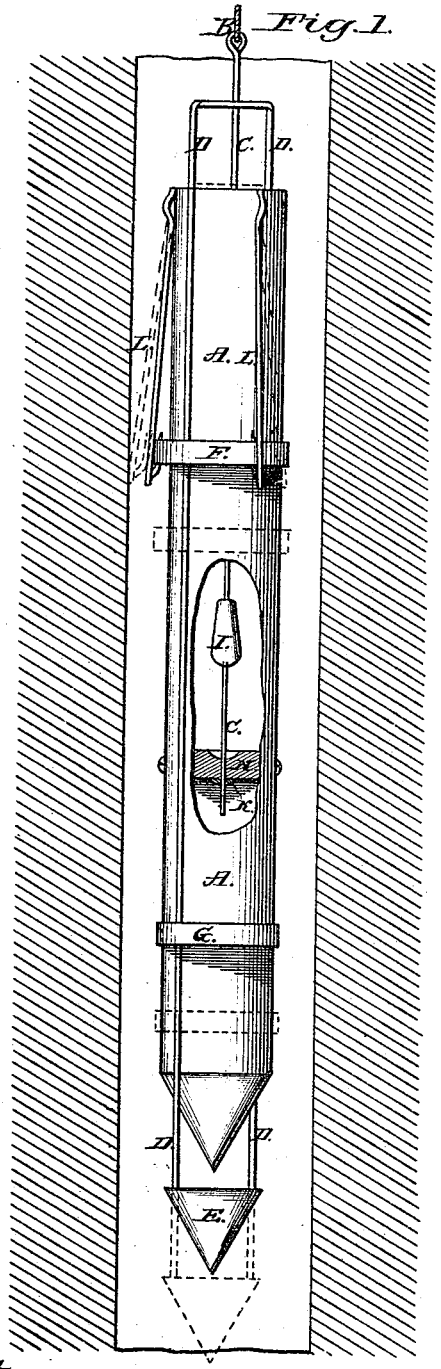
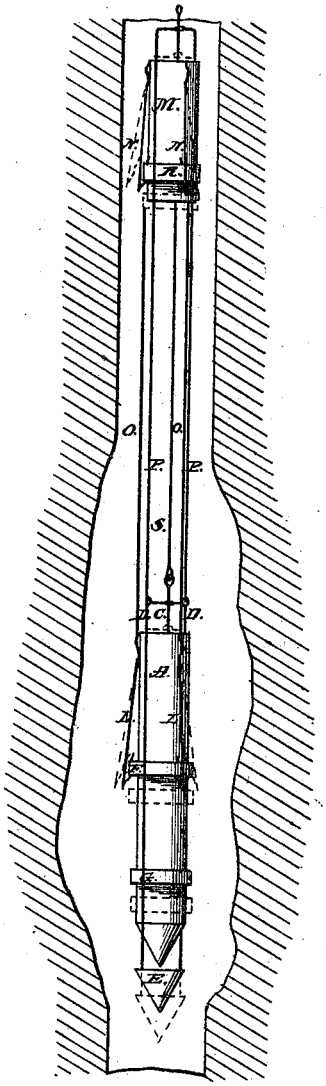


Fig. 2.



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WILLIAM H. HARPER, OF SHAMBURG, PENNSYLVANIA.

IMPROVEMENT IN TORPEDOES FOR OIL-WELLS.

Specification forming part of Letters Patent No. **166,986**, dated August 24, 1875; application filed May 15, 1875.

To all whom it may concern:

Be it known that I, WILLIAM H. HARPER, of Shamburg, Venango county, State of Pennsylvania, have invented certain Improvements in Renovators for Oil-Wells, of which the following is a specification:

My invention relates to that class of renovators securing the explosion of nitro-glycerine in the oil-bearing rock, for the purpose of shattering the rock, and thereby increasing the flow of oil. Heretofore the renovator has been suspended in the well by a cord or wire, and exploded by various methods while so suspended. By my process it will be made at the proper time to suspend itself in the well, and then be exploded by means of the same cord or wire used in lowering it to position.

In the drawing, Figure 1 represents the renovator in the well, suspended by the cord.

A is the shell or case, filled with nitro-glycerine. (A portion of the case or shell is here shown removed, so as to exhibit the manner of producing the explosion.) B is the cord or wire by which it has been lowered, and is now suspended. C is a central rod, to which the cord is attached. D is an iron rod or bail, forming a loop over and passing down on each side of the shell A, firmly attached to the cup E at the bottom. It is also firmly attached to the rings F and G. In the center of the loop or bail at the top is an eyelet-hole, through which the central rod C passes. The rod C also passes down through the center of the shell A, and through a fixed bridge, H, made of brass or other metal, and firmly retained in place by pins or screws through the shell A. The bridge does not entirely close the aperture or shell, but allows the nitro-glycerine to pass down on each side, and fill the cavity below. On the central rod C, and firmly attached thereto, is a hammer, I, made of brass or other metal, having the lower part convex, and made to exactly fit into a corresponding concavity in the upper side of the bridge H. On the bottom of the rod C is a button of wood or rubber, K, firmly attached to the rod, so as to prevent it from being drawn up through the bridge H, thereby suspending the entire weight of the renovator by the rod C. L L are springs attached to the shell A at its upper end. (A third spring on the opposite side of the shell cannot be seen in the drawing.) These are now held close down to the sides of the shell A by barbs passing under the ring F. While in this condition the whole apparatus can be raised or lowered at will by means of the cord B. When the position of the renovator is ascertained in relation to the oil-bearing rock it will then be lowered to the bottom of the well with some force. The eyelet-hole on the top of the rod C, resting on the bail D, will prevent the hammer I from coming in contact with the bridge H. The cup E, striking on the bottom, will force upward the bail D and rings F and G, the ring F moving upward sufficient to release the springs L L, and allowing them to spring out to the walls or sides of the well. It is now evident that the renovator can be drawn up; but the springs L L bearing against the sides will prevent the shell A from dropping. The cup E and rings F and G will drop till the loop of the bail D rests on the top of the shell A, as indicated by the dotted lines in the drawing. The renovator is then drawn up to the position required. The cord B is then suddenly slackened, allowing the rod C to drop, and the hammer I is brought in forcible contact with the bridge H, which, being surrounded with nitro-glycerine, produces the explosion.

In wells that have previously had renovators exploded in them the rock is liable to be shattered and removed to such an extent that the springs L L, when released, will not reach the sides of the cavity. Fig. 2 represents my manner of suspending the renovator in such cases. A duplicate, M, of the upper portion of the shell A is prepared, having springs N N, similar to L L. Rods O O, of any required length, form the connection between M and the shell A. Other rods P P form the connection with the bail D, and form a similar loop over M, and are firmly attached to the ring R, which holds down the springs N N in the same manner as the springs L L are held down by the ring F. The central rod C is also extended by the rod S.

It is evident that when the bail D is forced upward by the cup E the rods P P and ring R are also forced upward, and the springs N N are released at the same time with the springs L L. The rods O O now hold the

shell A suspended from M, and the explosion is produced in the same manner as before. A button on the rod S coming in contact with the loop of the rod P will allow the shell M to be drawn from the well after the explosion.

What I claim as my invention is—

1. The described arrangement and combination of the springs L L, the bail D D, ring F, the rod C, the bridge H, and hammer I, by which the renovator is made to suspend itself in the well, and the explosion produced by the manipulations of the single cord B, substantially as set forth.

2. The described arrangement and combination of the cylinder M, with its springs N N, rods O O and P P, operating in connection with the shell A and its attachments, substantially as and for the purposes set forth.

WILLIAM H. HARPER.

Witnesses:

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