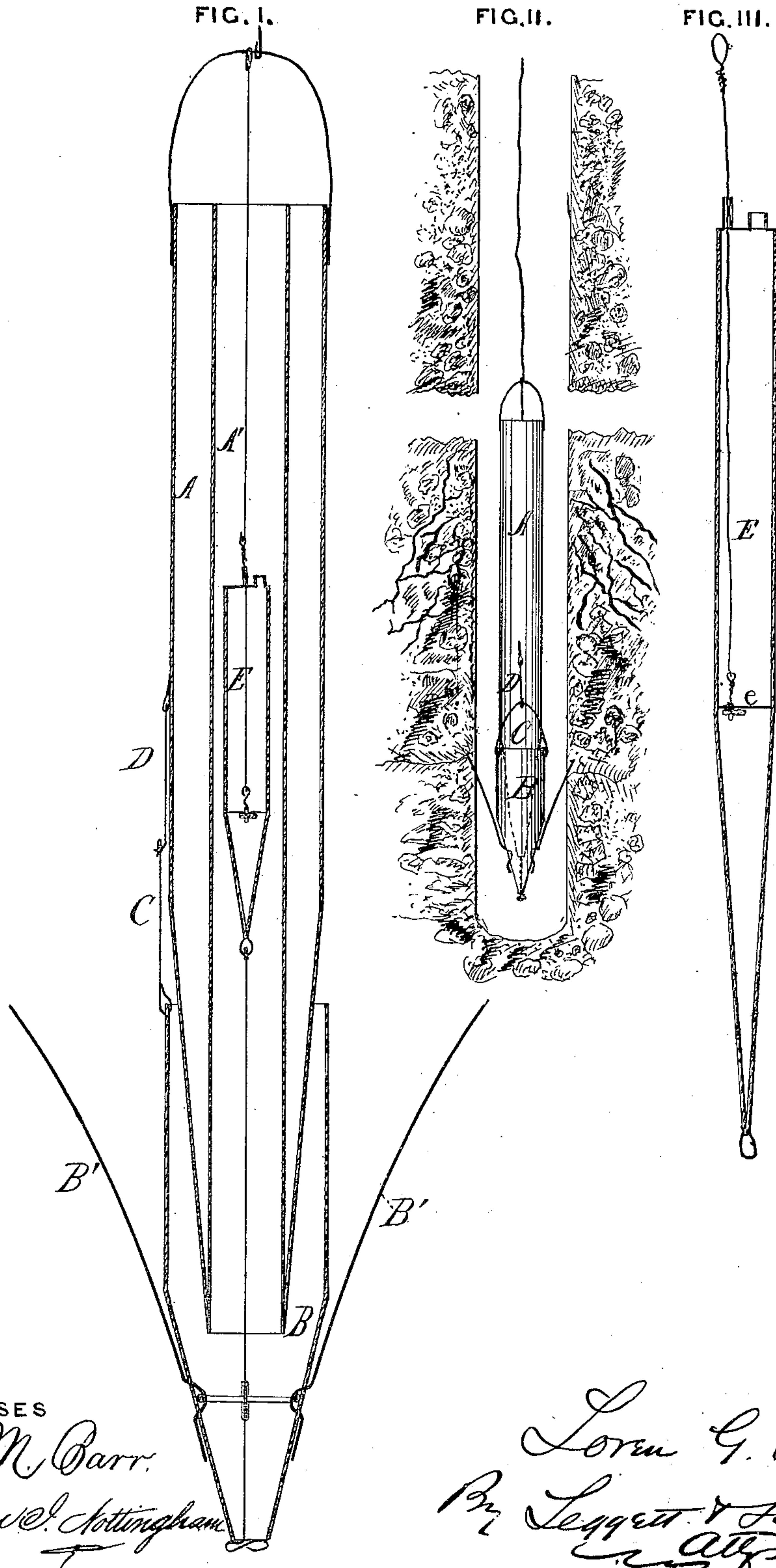


L. G. PECK.
Torpedoes for Oil- Wells.

No. 156,673.

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WITNESSES

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UNITED STATES PATENT OFFICE.

LOREN G. PECK, OF ROUSEVILLE, PENNSYLVANIA.

IMPROVEMENT IN TORPEDOES FOR OIL-WELLS.

Specification forming part of Letters Patent No. **156,673**, dated November 10, 1874; application filed August 27, 1874.

To all whom it may concern:

Be it known that I, LOREN G. PECK, of Rouseville, in the county of Venango and State of Pennsylvania, have invented certain new and useful Improvements in Torpedo for Oil-Wells; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use it, reference being had to the accompanying drawings, which form part of this specification.

My invention relates to an improvement in torpedoes for oil-wells, to be exploded by means of a friction-primer or its equivalent, by a steady pull from the top of the well.

My invention consists in a torpedo having a longitudinal tubular opening throughout its whole length, in which is located a firing charge or chamber. At the bottom of the torpedo is an anchor that resists any motion toward the top of the well. The bottom of the firing charge or chamber is connected by a wire to this anchor. The top of the firing-head is connected by a wire to the bail of the torpedo, or is otherwise securely attached to the torpedo. The torpedo being loosely attached to the anchor, a steady pull from the top of the well causes the anchor to catch, and eventually disengages the torpedo from the anchor. This sudden breaking throws the strain upon the wire of the friction-primer, which is attached to the torpedo, the firing-head is exploded, and it, in turn, explodes the torpedo.

In the drawings, Figure 1 is a longitudinal section of the torpedo. Fig. 2 is an external view of the torpedo as it appears in use in a well. Fig. 3 is a detached longitudinal section of the priming-chamber.

A is the body of a torpedo, provided with a longitudinal tubular opening, A', extending throughout its whole length. B is the anchor, having arms B', which freely yield and permit the torpedo to descend to any point, but are so hung that they strike into the sides of the well, and prevent the anchor from being drawn out of the well. To the top of this anchor is attached a bail or its equivalent, C, and upon

the torpedo is a catch or its equivalent, D, that retains the anchor with the torpedo, but which catch will loosen when the torpedo and anchor are steadily drawn apart. In the interior of the tube A' is the priming-chamber E. The bottom of this priming-chamber is secured by a slackened wire to the anchor B. Within the priming-chamber E is a friction-tube, and powder or nitro-glycerine, or other explosive, so arranged that by exploding the friction-primer the contents will be exploded, and cause the torpedo to explode. The wire connected to the priming-tube passes out of the top of the priming-chamber E, and is connected with the main torpedo. A cord or wire leads from the bail of the torpedo to the top of the well.

The nitro-glycerine or other explosive contained within the torpedo may be inclosed there by a stopper, if desired, which ordinarily is not necessary, owing to its specific gravity.

The firing-head is constructed as follows: The tube E is divided into two compartments, the lower one containing nitro-glycerine or other explosive, and in the partition between the lower and upper chambers is located the friction-primer *e*. The nitro-glycerine or other explosive is prevented from coming in contact with the powder of the primer by a suitable coating of tar or other equivalent compound, though the careful separation of the nitro-glycerine from the powder is not believed to be essential. The wire of the friction-primer passes up through the top of the head, which top portion is filled with nitro-glycerine, and a stopper placed in, or not, as desired.

The operation is as follows: The locality of the oil-rock is measured, and the point ascertained which is opposite to the oil-fissures. The torpedo is then attached to the wire or cord, the anchor loosely secured to the catch D, the firing-head E secured to the anchor and to the torpedo. The torpedo is then lowered by its bail to the desired point. When it reaches that point, the cord or wire by which it was lowered is drawn back. This causes the anchor to take a firm hold in the well, and a steady pull upon the wire is kept up at the top of the well until finally the catch D loosens

from the anchor, and the strain is suddenly thrown upon the wire that connects the anchor to the priming-chamber E. The priming-wire is consequently pulled out, and the torpedo exploded.

In case anything should happen to prevent the explosion, the anchor having broken loose, the torpedo and firing-head can be drawn up to the top of the well with safety.

I am aware that torpedoes have been arranged to be exploded by means of a friction-tube, either by dropping a weight from the top of the well to strike the friction-head, by dropping the torpedo itself, so that its friction-rod shall strike the bottom of the well, or an obstruction placed in the well, and by a sudden jerk given to the cord at the top of the well; but I am not aware that a torpedo has been constructed substantially as herein described, whereby the friction-tube is caused to explode by a steady pull upon the cord by which the torpedo was lowered into the well.

The construction of my torpedo insures perfect safety, and I avoid the danger of losing the torpedo, always consequent upon a sudden jerk from the top of the well.

This torpedo does not require a liquid tamping, and apparently works with better success in a dry well. In a dry well, the paraffine in the oil-fissures is more readily burned out by the heat of the explosion than it would be if there was an interposed liquid. Moreover, the explosion creates an almost perfect vacuum, which causes the loose materials to be drawn into the well, and more effectually serves to draw the oil from its fissures toward the well, and the difficulty is avoided that is frequently consequent upon the presence of liquid, of the latter rushing back from above after the ex-

plosion, and forcing loose matter into the oil-fissures and wedging it there. However, if there is liquid in the well, the effect of the torpedo will be sufficient, though less perfect. If there is no liquid in the well, none should be placed in it to assist the blast.

Instead of lowering the torpedo from the top of the well, and stopping it at a certain point, I prefer, generally, to ascertain the distance from the bottom of the well of the point at which the explosion is required, and then attach a standard to the anchor B of that length, and lower the torpedo until that standard strikes the bottom of the well; but it is understood that I do not claim the employment of the standard at the bottom of the well.

What I claim is—

1. The combination of torpedo A A', anchor B B', and firing or exploding charge E, constructed and arranged to operate in the manner substantially as set forth.

2. An oil-well torpedo, provided with an anchor that prevents any upward motion, the whole constructed and adjusted to admit of exploding the charge by a steady pull from the top of the well, substantially as described.

3. The torpedo A, with a tubular opening, A', extending through its whole length, in combination with a firing-charge, E, arranged within said tubular opening in the body of the torpedo, substantially as described.

In testimony that I claim the foregoing I have hereunto set my hand this 18th day of August, 1874.

LOREN G. PECK.

Witnesses:

WELLS W. LEGGETT,
WM. H. MINNIX.