

E. E. SWETT.
OIL WELL TORPEDO.

No. 179,077.

Patented June 20, 1876.

Fig. 1.

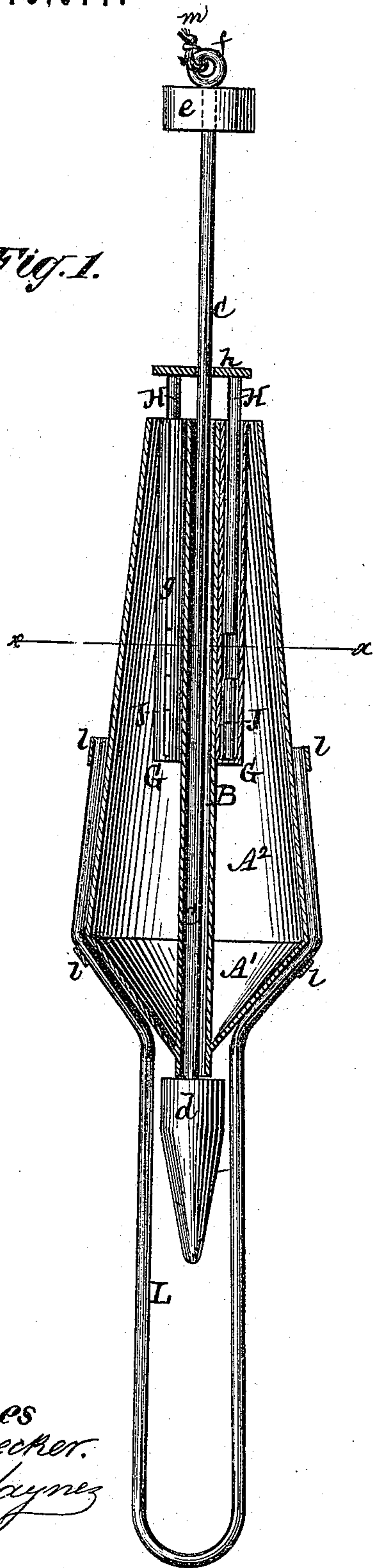
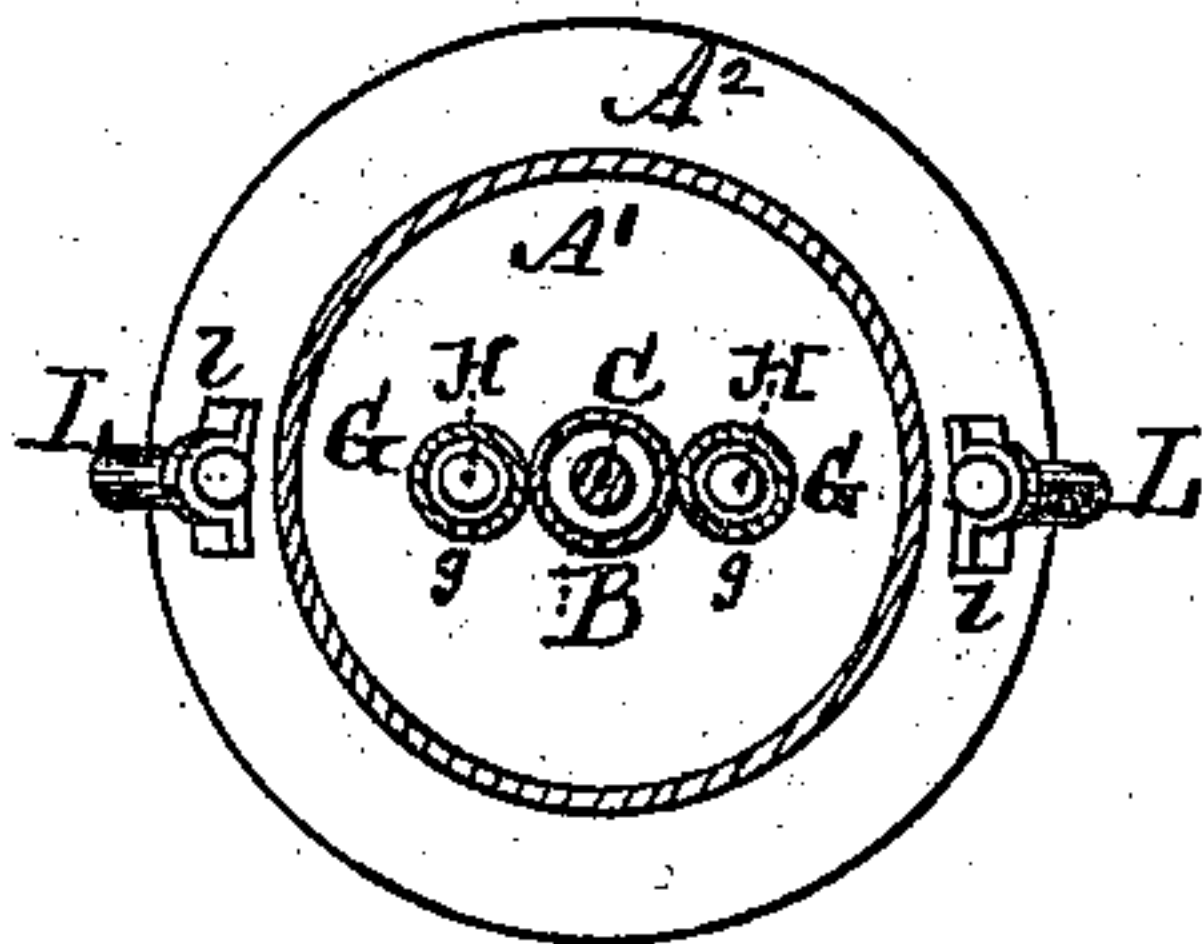


Fig. 2.



Witnesses
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EDWARD E. SWETT, OF KNOX, PENNSYLVANIA.

IMPROVEMENT IN OIL-WELL TORPEDOES.

Specification forming part of Letters Patent No. 179,077, dated June 20, 1876; application filed May 21, 1875.

To all whom it may concern:

Be it known that I, EDWARD E. SWETT, of Knox, in the county of Clarion and State of Pennsylvania, have invented an Improved Oil-Well Torpedo; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawing, which forms part of this specification.

My invention relates to a torpedo, which is intended more particularly for use in oil-wells, for the purpose of fracturing the oil-bearing rocks, in order to increase and facilitate the flow of oil; but which may be used for general blasting purposes.

The invention consists in a novel construction, arrangement, and combination of the various parts, whereby the torpedo is rendered self-exploding and self-tamping, and the explosive substance is so disposed as to enable it to exert the greatest force in the proper direction.

In the accompanying drawing, Figure 1 is a central vertical longitudinal section of a torpedo constructed according to my invention. Fig. 2 is a transverse section, taken in the line *x x* of Fig. 1.

The shell or flask for holding the explosive substance may be made of metal, glass, or any other suitable material. The bottom of the shell is in the shape of an inverted cone, *A*¹, the base of which forms the widest part of the flask, and from which base the upper portion *A*² tapers to the top, which is open. In the center of the shell is a tube, *B*, which extends the entire length of said shell, the lower end being attached to the apex of the cone *A*¹ by soldering, or otherwise, so as to form a tight joint, and the upper end being suitably braced in the upper portion of the shell. Both ends of the tube are open, and through it passes a rod, *C*, of a length considerably greater than that of the shell. At the lower end of the rod is a weight, *d*, and at the upper end is a weighted head, *e*, and also an eye, *f*, for the attachment of a cord or chain, *m*. In the shell are two tubes, *G G*, which may be attached to the central tube *B*, one on each side. These tubes are slotted longitudinally for the whole or a portion of their length, as shown at *g*, and about midway of their

length, or at any other suitable points, are caps *J*, containing fulminate. Rods *H H* are arranged to slide in the tubes *G G*, the upper ends of the rods being connected by a plate or bar, *h*, having a perforation to allow the rod *C* to pass freely. The rods *H H* serve as hammers for exploding the fulminate in the caps *J*. The lower end of the shell is provided with a rest, consisting of a wire, *L*, bent so as to form a loop extending below the bottom of the shell beyond the point reached by the weight *d*, when at its lowest point, the ends of the wire being attached to the shell by passing into staples or eyes *l*, or in any other suitable manner.

The operation is as follows: The shell or flask is charged with nitro-glycerine, or other suitable explosive substance, to a height somewhat above where the caps *J* are located in the tubes *G*. A cord or chain, *m*, is attached to the eye *f*, and the torpedo is suspended thereby with the parts in the positions shown in Fig. 1, the shell being supported by the lower end of the tube *B* resting on the shoulders of the weight *d*, and the hammers *H* resting in the tubes, with their lower ends immediately above the caps *J*; but prevented from actual contact therewith by means of a film of nitro-glycerine between said hammers and caps, forming a cushion sufficient to prevent such actual contact. By means of the slots *G* the nitro-glycerine is enabled to enter said tubes from the shell or flask, and come in contact with the caps *J*, and also rise above them to form the cushion for the hammers. While in the position shown, the apparatus is lowered into the well until the loop *L* rests upon the bottom of the bore. The cord *m* is then released so as to allow the weighted rod *C* to fall suddenly until the weighted head *e* strikes the upper ends of the hammer *H*, whereupon they are driven forcibly down upon the caps *J* containing the fulminate, so as to ignite the same, and explode the nitro-glycerine. By this arrangement and combination the torpedo is rendered self-exploding, there being no separate exploding-chamber. By the tapering form of the shell it is rendered self-tamping, as such tapering form causes the force of the explosion to be exerted downwardly and laterally, and prevents it from operating in a di-

rectly-upward direction. The explosive substance, being ignited at or near the top, burns downward, and as the shell is tapering and smallest at the top, and as the opening in the top is partially or almost entirely obstructed by the tubes J J and the plate or bar *h*, the resistance offered to the upward escape of gas is greater than would be offered by a cylindrical shell with its upper end open and entirely unobstructed, and consequently the force of the explosion is thrown downward and outward, tending to expand the shell laterally, near its midlength, and thus render it self-tamping. By means of the central tube B the explosive substance is distributed in an annular form, which, with the double conical shape of the shell, enables said substance to exert the greatest force in a lateral direction.

The number of hammers, with their tubes and fulminate-caps, need not be limited to two, as it is obvious that any suitable number may be used.

What I claim as new, and desire to secure by Letters Patent, is—

1. The combination of the double conical shell A¹ A², the central tube B, and the plate or bar *h*, whereby the torpedo is rendered self-tamping, and the explosive substance is so disposed as to exert the greatest force in a lateral direction, substantially as herein described.

2. The combination of the slotted tubes G, containing the caps or fulminate-holders J, the hammers H, sliding in said tubes, and the weighted rod C, provided with the head *e*, whereby the torpedo is rendered self-exploding, substantially as described.

EDWARD E. SWETT.

Witnesses:

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