P. E. WELLMAN.

Torpedo for Oil-Wells.

No. 207,325 Patented Aug. 20, 1878.

Fig. 2

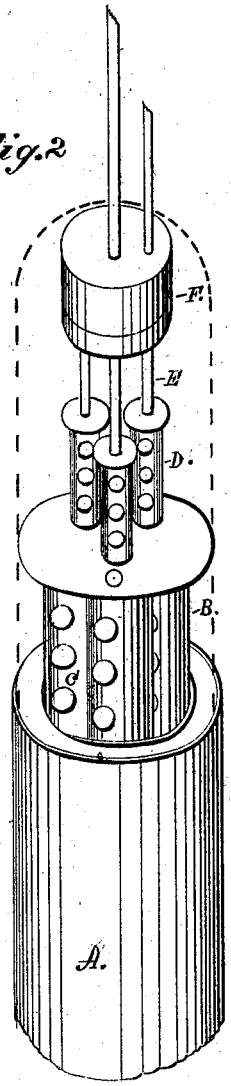
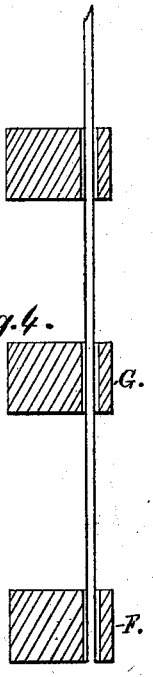


Fig. 4.



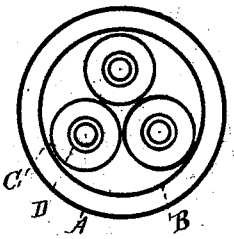
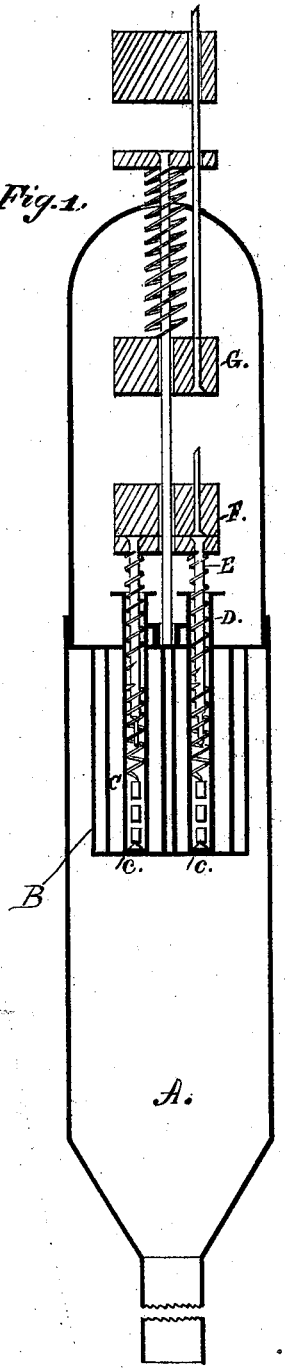


Fig. 3.

Fig. 1.



Witnesses.

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UNITED STATES PATENT OFFICE.

PROSPER E. WELLMAN, OF ST. PETERSBURG, PENNSYLVANIA.

IMPROVEMENT IN TORPEDOES FOR OIL-WELLS.

Specification forming part of Letters Patent No. **207,325**, dated August 20, 1878; application filed May 21, 1878.

To all whom it may concern:

Be it known that I, PROSPER E. WELLMAN, of St. Petersburg, in the county of Clarion and State of Pennsylvania, have invented certain new and useful Improvements in Torpedoes for Oil-Wells and other purposes; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

Torpedo-fuses may be classified according to their mode of operation—percussion, friction, chemical, and electric fuses.

My invention relates to the first class, which comprises all fuses in which the flame is produced by a blow on some fulminating compound. The fulminate is generally in the form of the ordinary percussion-caps. The blow may be produced in various ways, as by releasing compound springs, which act on a hammer, or by dropping a weight. I prefer the latter; but I use as an auxiliary the former.

In all cases where fuses of this kind have been used it is customary to employ several and place them in the torpedo inclosed with small cylinders, but of different construction and mode of operation from mine, as will hereinafter more fully appear; and while mine is particularly applicable to oil-wells, they may be applied to blasting, mining, and other branches of industry with equally good effect. They seldom, if ever, fail, are simple in construction and action, cheap in first cost, and are not very liable to get out of order, even when left submerged, provided the water will not be allowed to enter the vessel holding the caps or fulminate. They are, however, sensitive, and must be handled with great care.

The action of the fulminate sometimes becomes sluggish, and will not ignite by the first blow, a second, nor a third—in fact, may not at all. Then the torpedo will have to be withdrawn and reprimed, which process is ordinarily very dangerous. To avoid this danger is principally the object I have in view by my invention.

I am aware that there are many kinds of fuses; that small cylinders centrally arranged one within the other have been used; and I know it is not new to use weights for igniting the fulminate or exploding the caps within said cylinders; and I know the inner tubes have been slitted for various reasons, to none of which I lay claim broadly.

In the slitted tubes the caps are placed, and, on failure to explode when the weight falls several times, the slitted tubes bulge out at the sides, the cap has a tendency to fall from a vertical line against the side, and when the plunger comes down to where it should strike the cap it lags or is deflected to one side, failing to explode the cap, and damaging the tube in such a manner that it can only be removed by unsoldering the head of the largest cylinder and removing the whole nest.

Now, to obviate this difficulty, and to more nearly insure the certain explosion of the torpedo, and to facilitate the more ready withdrawal of the small tubes containing the fulminate when necessary, are the objects of my invention; and it consists, first, in making the tubes holding the fulminate or caps of different lengths and arranging the weight in such a manner that only a portion of the plungers or hammer-rods will receive the blows at one time, so that if one series fail the other series is then utilized; and it further consists in perforating the tubes and arranging the caps and plungers therein, so that they at all times remain in a vertical position by means of springs, and also arranging the springs so that they will both act to impart to the weights additional force, and at the same time suspend and direct the plungers in their course.

Referring to the accompanying drawing, Figure 1 represents a nitro-glycerine torpedo in vertical longitudinal sections with my improved percussion apparatus applied thereto. Fig. 2 represents a perspective view of the apparatus, plainly showing the various tubes, plungers, weights, bridges, &c., and the mode of inserting the fuse apparatus into the torpedo. Fig. 3 shows a cross-section of the torpedo, the inner cylinders, the three large perforated cylinders, the small inner perforated cylinders, and the plungers or the hammer-rods; Fig. 4, the weights, which may be dropped one after another on the failure of the first or second to explode the torpedo, and

may be repeated as long as may be thought necessary.

Like letters indicate like parts in all the figures.

A represents the body of a torpedo, which may be of any size or shape, but round is preferred. The cylinder B may be located to one side of the torpedo, or may be concentric, as shown. This cylinder is tight at its bottom, and before explosion communicates nowhere with the material in the torpedo. Within the cylinder B are located two or more small cylinders, which rest upon the bottom of said cylinder B, and within these smaller cylinders are still smaller cylinders or tubes D, also perforated, and which hold the caps or fulminate C. Resting upon these caps is a small spiral spring partly surrounding the plunger or hammer rod E, resting against a small shoulder on the lower end of said plunger, for the purpose of keeping the lower end of the plunger from resting upon the caps; and upon the upper portion of each of the plungers is located another spring, which serves to prevent the plungers or hammer-rods lagging to one side when the blow is struck, thus keeping them in a vertical position, notwithstanding they may receive several blows.

In Fig. 1 the weights F are shown resting easily on tops of two of the plungers; but when desired to explode the torpedo, the weight is raised and allowed to fall with great force, and drives the plungers, which are provided with knife-edges, into the fulminate, causing it to explode and ignite the nitro-glycerine which passed through the perforations, shattering the cylinder B, and in turn exploding the torpedo.

Now, should the first operation fail to cause the explosion, then another weight is dropped upon top of the first, and should this also fail to explode, then comes the next; and this forms the gist of my invention.

It will be readily seen that the central plunger is much larger than the others, and passes up through all the weights very loosely, and projects through the upper bridge in such a manner that it meets no obstruction on its downward course but the caps in the bottom of the tube.

It will also be observed that the central tube is shorter than the others, so much so that when the weights of the others fall they will not touch the center one. Now, as before stated, when the others fail, a weight is so arranged as to be dropped upon the central plunger, which is designed to cause the caps in the central tube to explode in the same manner as the former ones, and should the first blow fail in this, then the blow may be repeated until thought advisable to stop, when, if the whole of them fail, then the smallest of the cylinders are taken out, as before described, and reloaded; but it is thought that, if the load is properly put into the torpedo and my apparatus suitably applied, there will be no possibility of failure.

The tubes and plungers may be so arranged as to receive the blows simultaneously or independently.

It is evident that modifications can be made embodying the principles I have laid down without departing from the spirit of my invention.

The common method of bails, bridges, &c., may be used, and also the same method of charging. A small cone or anvil is used on the bottom of the inner tube to assist in exploding the caps.

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

1. The combination, in a torpedo, of the double series of perforated tubes, their plungers or hammer-rods, provided with springs on their upper portion, and upon their lower portion between the caps and the ends of said plungers, for the purpose set forth and described.

2. The combination, in a torpedo, of the short tubes, with their plungers or hammer-rods, the long tubes and their hammer-rods, with their co-operating weights, springs, and cap, constructed and arranged to operate in the manner set forth and described.

3. In a torpedo for oil-wells, the combination of the outer cylinder B, series of perforated cylinders C, inner perforated cylinders D, having caps *c*, and their plungers or hammer-rods, provided with springs, arranged to operate in the manner set forth and described.

In testimony that I claim the foregoing as my own I hereby affix my signature in presence of two witnesses.

PROSPER ELI WELLMAN.

Witnesses:
J. D. WELLMAN,
DANIEL CLARK.