(No Model.)

E. L. ZALINSKI.

METHOD OF FIRING TORPEDOES BY ELECTRICITY.

No. 341,537. Patented May 11, 1886.

Fig. 1

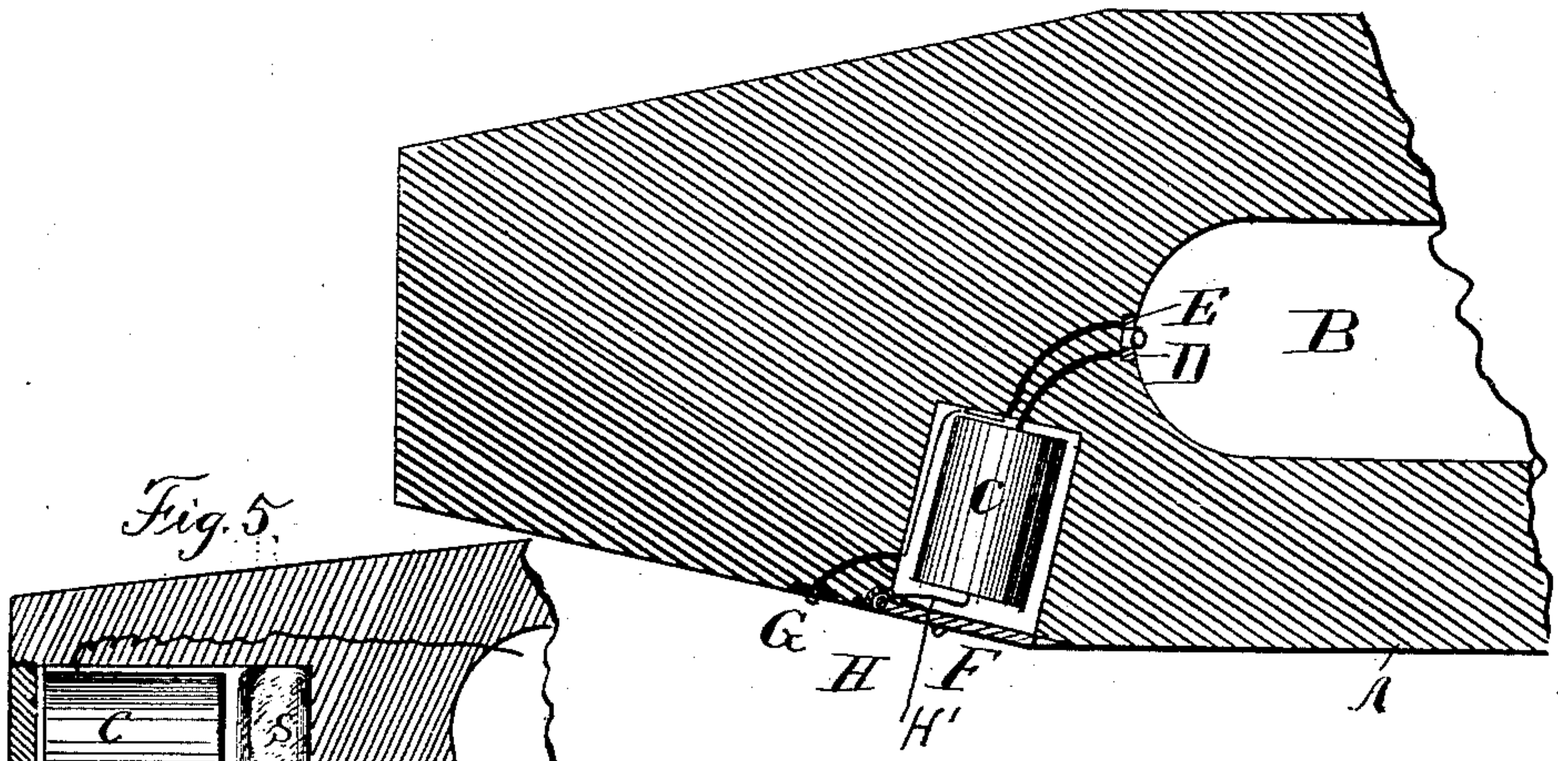


Fig. 5.

Fig. 2.

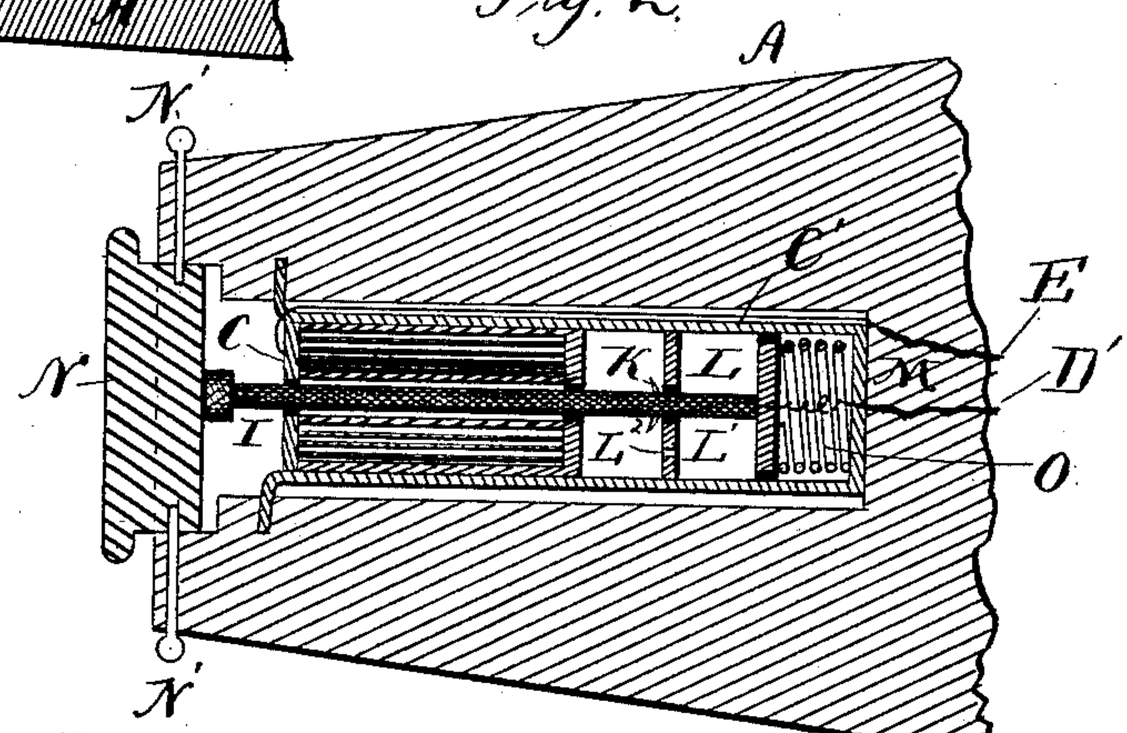


Fig. 4.

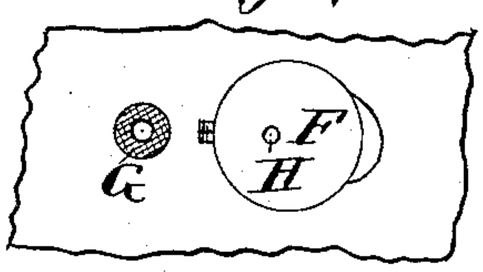
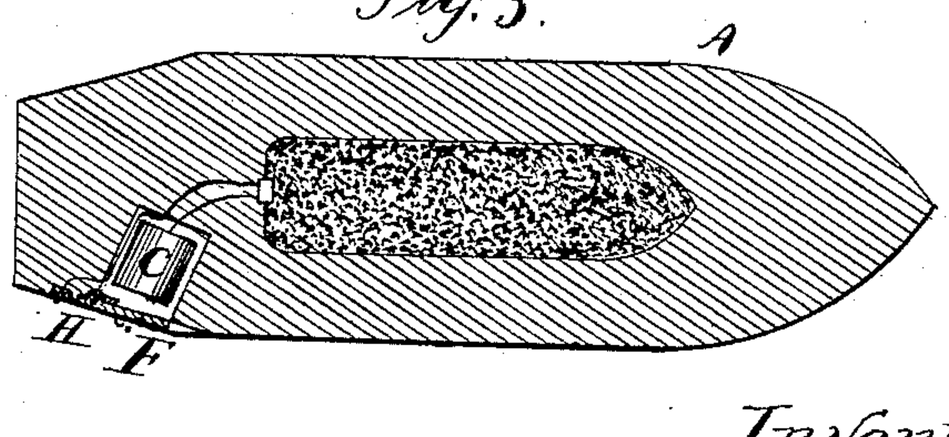


Fig. 3.



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UNITED STATES PATENT OFFICE.

EDMUND L. ZALINSKI, OF THE UNITED STATES ARMY.

METHOD OF FIRING TORPEDOES BY ELECTRICITY.

SPECIFICATION forming part of Letters Patent No. 341,537, dated May 11, 1886.

Application filed February 2, 1886. Serial No. 190,705. (No model.)

To all whom it may concern:

Be it known that I, EDMUND L. ZALINSKI, of the United States Army, stationed at Fort Hamilton, State of New York, have invented certain new and useful Improvements in Methods of Firing Projectiles and Exploding Mines, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to electric fuses for shells and torpedoes, and the method of using the same.

The invention consists in certain improvements on my patented fuse, No. 313,150, of March 3, 1885, and in a construction by which the battery may be kept dry and unsensitized until the projectile is immersed in water, and in the method of using dry-battery fuses.

Figure 1 is a longitudinal section of a portion of a projectile, showing battery and hinged cover. Fig. 2 is a longitudinal section of a differently-located battery with time attachment. Fig. 3 is a section similar to Fig. 1, showing the projectile and battery on reduced scale. Fig. 4 is a face view of the hinged cover and connecting-wire. Fig. 5 is a section of a modification.

A indicates the body of the projectile, which may be of any known or usual form either for guns or torpedoes. B is the charge-chamber thereof.

C is an electric battery, having one of its elements connected by wire D with the primer in the charge-chamber. The other battery element is connected to wire E through a circuit, which will now be described. The wire E (all wires being insulated) extends to button G, where it reaches the exterior of the projectile. The cover F, which is thrown open by a spring-hinge, has a button, H, in position to bear against the button G when the cover is thrown back, and the cover, by wire H′, is connected with the other element of the battery from the one connected with wire D.

The body of battery C is perforated for the admission of water, and the exciting elements are placed in the battery dry, so that there is no chemical action until water is admitted. When cover F is closed, no water can reach the battery, and if it did there is no electrical circuit between the button G and the point H, both button and cover being insulated. In the position shown in full lines the cover will be kept closed when the projectile is placed in the bore of a gun or torpedo-tube, and cannot open until it leaves the muzzle. Thus, should the battery acquire moisture in the bore of the gun, no explosion could take place until the projectile had passed far enough from the muzzle to allow the cover to turn and close circuit. The cover, however, should be so tight as to exclude moisture from the battery when it is closed.

Instead of making the cover a hinged cover, as in Fig. 1, it may be a plug, as in Fig. 2, in which figure N indicates the cover, held in position by lead pins N′, or by similar weak devices. When the shot is fired, the pressure breaks these pins. As soon as the projectile leaves the gun, the spring O, bearing against the piston-rod I, forces the cover out of its seat. In this case the wire D′ is connected to the piston-rod, which passes through a hole extending lengthwise of the battery C. The piston L fits tightly in the casing C′ of battery C. The air in chamber L′ in front of the piston must be driven through the small aperture L^2 before the piston can advance its full distance, so that points K reach the end of the battery-cell to close circuit. The size of aperture L^2 will thus determine the rapidity of movement of the piston and the time which will elapse after the cover is removed before the movement of the piston can close circuit.

It will be understood that a liquid instead of air may be used in chamber L, and that the same retarded movement may be given to a part of the circuit-closing device, whether the hinged cover F or the plug N be used to cover the battery.

The special object of my unsensitized battery and retarded circuit-closer is to permit the projectile to be thrown into water and sink some little distance before the explosion takes place. This will be effected by the retarded piston if the battery become sensitized very soon after it leaves the gun.

It will be understood that I do not confine myself to any particular form of battery, as any high-tension battery can be made to serve.

The size of the aperture for the admission of water may be graduated so that the water will be admitted very slowly; or the aperture

may be plugged with a material soluble in water, as gelatine or a similar substance. In such case the water will enter the battery to sensitize the same only after an interval of time, which can be approximated with considerable accuracy, the amount or character of the substance to be dissolved determining the time.

The projectile containing the dry battery is thrown from a pneumatic or similar cannon into the channel, or in advance of an approaching hostile ship, and will explode as a submarine torpedo as soon as the battery becomes sensitized.

To clear a harbor or channel of fixed torpedoes, the projectile, charged with dynamite or other high explosive, can be thrown by guns on shipboard into the channel ahead, the battery being so timed as to explode soon after the projectile reaches the bottom. The explosion of one hundred pounds of dynamite at the bottom of a channel will, it is believed, remove all obstructions, and explode torpedoes or break the connecting-wires to them throughout a radius of one hundred feet or more. It will thus be possible for a ship to clear away all fixed torpedoes in advance of its own movement.

The modification, Fig. 5, represents a movable battery, C, in the shell, and a capsule, S, of a fluid, which may be water or other exciting-liquid, which will be broken by this shock when the projectile strikes, and will thus sensitize the battery.

I claim—

1. The method of exploding submarine torpedoes, which consists in charging the torpedo with a bursting-charge and a non-sensitized electric battery, then projecting the same into the water and causing the explosion by the admission of fluid to the electric battery, as set forth.

2. The method of exploding submarine torpedoes, which consists in charging the torpedo with a bursting-charge and placing a non-sensitized battery in the same, then projecting the torpedo into the water and sensitizing the battery by the admission of water, substantially as described.

3. The method of exploding a projectile, which consists in inclosing a non-sensitized electric battery therein, firing the projectile into water, and permitting the admission of water to sensitize the battery by the dissolving away of a soluble compound, all substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

EDMUND L. ZALINSKI.

Witnesses:

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