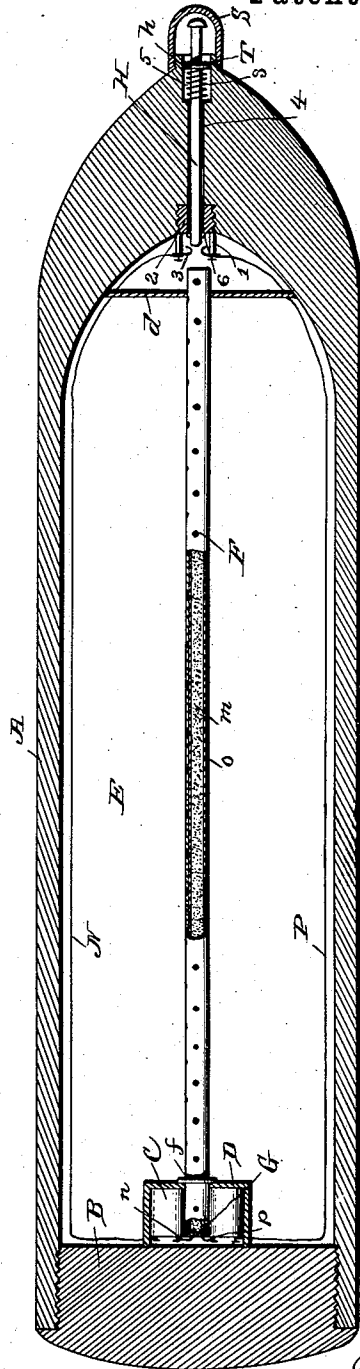


(No Model.)

J. W. GRAYDON.
ELECTRICAL FUSE FOR ORDNANCE SHELLS.

No. 399,879.

Patented Mar. 19, 1889.



Witnesses,

Albert Speiden,
Robert Owens.

Inventor,

James Wain Graydon

By *his* Attorney,

Wm. Hunter Myers

UNITED STATES PATENT OFFICE.

JAMES WEIR GRAYDON, OF WASHINGTON, DISTRICT OF COLUMBIA, ASSIGNOR
TO ROBERT SOUTHWORTH LAWRENCE, OF LONDON, ENGLAND.

ELECTRICAL FUSE FOR ORDNANCE-SHELLS.

SPECIFICATION forming part of Letters Patent No. 399,879, dated March 19, 1889.

Application filed October 9, 1888. Serial No. 287,631. (No model.)

To all whom it may concern:

Be it known that I, JAMES WEIR GRAYDON, a citizen of the United States of America, residing at Washington, in the District of Columbia, have invented certain new and useful Improvements in Electrical Fuses for Ordnance-Shells, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates to an electrical fuse for ordnance-shells; and it has for its object to provide a fuse which will be ignited by electricity when the shell strikes.

The invention will first be described in connection with the accompanying drawing, and then pointed out in the claims.

The drawing is a longitudinal section of a shell provided with my improved electrical fuse, showing the battery-connection for igniting the same, the battery-cups and fuse being in elevation and the latter partly broken away.

A represents the shell closed at the rear end by a screw-plug, B.

C are the battery-cups, which are held in place by a boxing, D, resting against the inner end of plug B, which boxing, in turn, is held in place by the bursting-charge to be placed in the charge-chamber E of the shell.

F represents the fuse-tube, of any suitable rigid material, extending from near the front end to near the rear end of the charge-chamber and perforated throughout its length.

The rear end of this tube passes through a perforation in boxing D, and is held a short distance from the plug B by a flange, f, which rests against the front end of the boxing, while the forward end of the tube passes through an opening in a disk, d, at the front end of the charge-chamber. The tube is filled with any suitable fuse material—as fulminate of mercury *m*—inclosed in thin paraffined paper *o*, and to its lower end is secured a platinum disk, G, with which are connected wires *n p* from opposite poles of the battery.

N and P are wires connected to the negative and positive poles of the battery and leading to the front end of the charge-chamber, where they are secured to binding-posts 1 1, inserted in a hollow screw-plug, 2, screwed

into the shell, the said posts being provided with the usual contact-plates 3 3.

H represents a metal plunger which passes through a perforation, 4, in the forward end of the shell and through the hollow plug 2, it being held normally out of contact with the contact-plates by means of a coiled spring, s, seated in a recess, 5, formed in the front end of the shell and surrounding the plunger, the lower end of said spring bearing on the bottom of the recess and its upper end engaging with a flange, h, on the plunger, a pin, 6, passed through the inner end of the plunger, limiting its outward movement.

In order to prevent the plunger being accidentally pushed into contact with the contact-plates, and also to prevent moisture entering the shell, I cover the outer end of the plunger with a soft-metal cap or shield, S, which is screw-threaded internally to screw onto a screw-threaded projection, T, on the front end of the shell.

The operation of my electrical fuse is very simple. As the shell strikes, the shield S will be broken and the plunger forced into contact with the contact-plates, thus closing the electric circuit, when the platinum disk will at once become sufficiently heated to ignite the fuse material, the force of whose explosion will be transmitted to all parts of the bursting-charge through the perforations in the tube; and if the bursting-charge is dynamite or other high explosive the detonation will be simultaneous and complete.

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

1. An electrical fuse for shells, consisting of a battery, a perforated fuse-tube containing the fuse material, said tube provided with a platinum disk and extending longitudinally of the charge-chamber in the shell, battery-wires normally out of circuit, and a movable plunger in one of the walls of the shell, adapted to be forced longitudinally between the ends of said wires to close the circuit, all combined substantially as described.

2. An electrical fuse for shells, consisting of a battery located at the rear end of the charge-chamber of the shell, a perforated

5 fuse-tube containing the fuse material, said tube provided at its rear end with a platinum disk and extending longitudinally of the charge-chamber, binding-posts provided with contact-plates at the front end of the charge-chamber, battery-wires normally out of circuit leading to and connected with said binding-posts, and a movable plunger in the front wall of the shell, adapted to be forced longi-

tudinally between said contact-plates to close the electric circuit, all combined substantially as set forth.

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

JAMES WEIR GRAYDON.

Witnesses:

WM. HUNTER MYERS,
CHARLES F. ROBERTS.