W. F. GOODWIN.

Shell-Fuse.

No. 45,035. Patented Nov. 15, 1864.

Fig. 1.

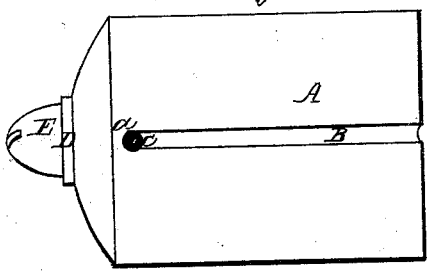


Fig. 2.

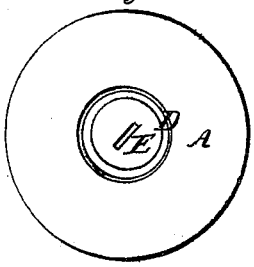


Fig. 3.

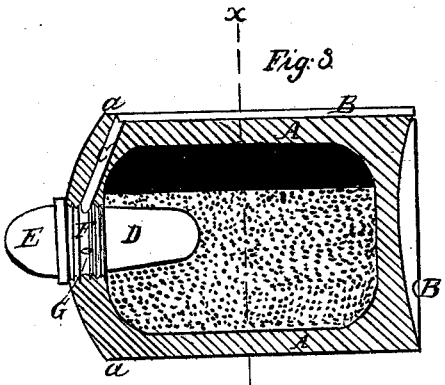


Fig. 4.

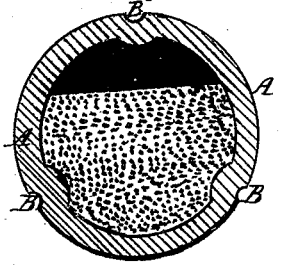


Fig. 5.

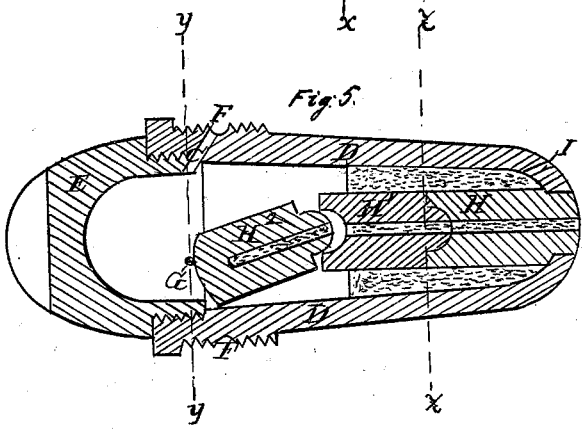


Fig. 6.

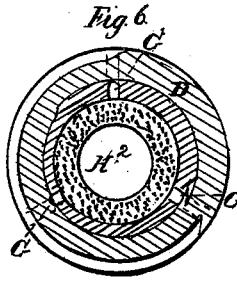
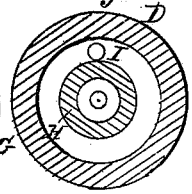


Fig. 7.



Witnesses;

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UNITED STATES PATENT OFFICE.

WM. F. GOODWIN, OF NEW YORK, N. Y.

IMPROVEMENT IN CONCUSSION-FUSE FOR SHELLS.

Specification forming part of Letters Patent No. **45,035**, dated November 15, 1864.

To all whom it may concern:

Be it known that I, WILLIAM F. GOODWIN, of the city, county, and State of New York, have invented a new and Improved Combined Shell and Fuse; and I do hereby declare the following to be a full and exact description of the same, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is a side elevation of a combined shell and fuse illustrating my invention. Fig. 2 is a front view of the same. Fig. 3 is a central longitudinal section of the same, the fuse being shown in elevation. Fig. 4 is a transverse section thereof at *x x*, Fig. 3. Fig. 5 is a central longitudinal section of the fuse, illustrating the manner of effecting the explosion of the shell at the instant it falls or strikes. Fig. 6 is a transverse section of the fuse at *y y*, Fig. 5, looking backward. Fig. 7 is a transverse section thereof at *z z*, Fig. 5, looking backward.

In Figs. 5, 6, and 7 the fuse is shown on an enlarged scale to illustrate its construction more clearly.

Like letters of reference indicate like parts in all the figures.

The subject of my present invention is a combined shell and fuse adapted to be ignited by fire from the projecting charge without the aid of a quick-match, and exploded instantaneously on striking or falling; and it consists in providing within the fuse-stock a sectional tube of peculiar construction, adapted to be embedded in meal-powder, so that when the latter is partially burned away the falling or striking of the shell will result in the instantaneous separation of the tube, and thus cause fire to be communicated to the interior of the shell through an aperture in the rear end of the fuse.

The following description will enable any one skilled in the art to which my invention appertains to fully understand and use the same.

A represents an elongated shell, the exterior of which is, by preference, made of cylindrical form.

B B B represent a series of longitudinal grooves extending from the rear of the shell nearly to its forward end, but leaving in front an unbroken belt, *a*, extending completely around the shell, and intended to closely fit the bore of the piece with which it is to be used.

C C are perforations extending from the forward ends of the grooves B inwardly to the fuse-aperture. The fuse D is completely closed in front by a screw-cap, E, and is screw-threaded at *d*, for the purpose of securing it in the shell in customary manner, as shown in Fig. 3.

At or near the mid-length of the thread *d* is a groove, F, surrounding the fuse and forming a connecting-channel between the inner ends of the perforations C C, and similar perforations, G G G, leading to the interior of the fuse itself.

H H′ H² represent parts of a sectional or divided tube, closed in front and secured at its rear end in an aperture prepared for it in the rear of the fuse. Each section of this tube is formed with a projection fitting a corresponding socket in the adjoining end of the next section, so that they may hold together with sufficient force to hold the tube in horizontal position. When so held together, the tube communicates with the interior of the shell-chamber, but not with the interior of the fuse-chamber.

I represents an aperture in the rear of the fuse, through which fire is communicated to the interior of the shell when the explosion is not previously effected by concussion, as hereinafter explained.

Operation: To prepare the fuse for use, the tube H H′ H² is placed in position axially within the fuse, and is so secured by packing meal-powder around it. The cap E is then applied, and the interior of the tube is charged from the rear with rifle-powder. The fuse is then ready for insertion in the charged shell. On firing the gun the pressure of the burning gases forces them through the grooves B F and perforations C G to the interior of the fuse, where they ignite the meal-powder, which continues to burn as the shell pursues its flight. Immediately on the striking of the shell upon the ground or against any opposing body such sections of the tube as may have been released by the burning away of the powder are detached from the remainder, scattering the rifle-powder upon the burning mass and causing fire to be instantaneously communicated to the bursting-charge within the shell. If from any cause the explosion of the shell should not be thus effected before the

meal-powder within the fuse is burned out, fire will be communicated through the aperture I, and the shell exploded by this means. The meal-powder packed around the tube effectually secures the latter against displacement during the handling of the fuse and shell and until the powder is burned away, as above described, and after this the tube is held together sufficiently to support its weight until any slight concussion or arresting of the motion of the shell. The unbroken belt or zone *a*, at the front of the shell, by confining the gases causes them to be forced with greater certainty into the fuse.

Having thus described my invention, the following is what I claim as new therein and desire to secure by Letters Patent:

A concussion-fuse provided with a sectional tub, H H′ H², constructed and adapted to operate in the manner and for the purposes herein described.

WM. F. GOODWIN.

Witnesses:
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