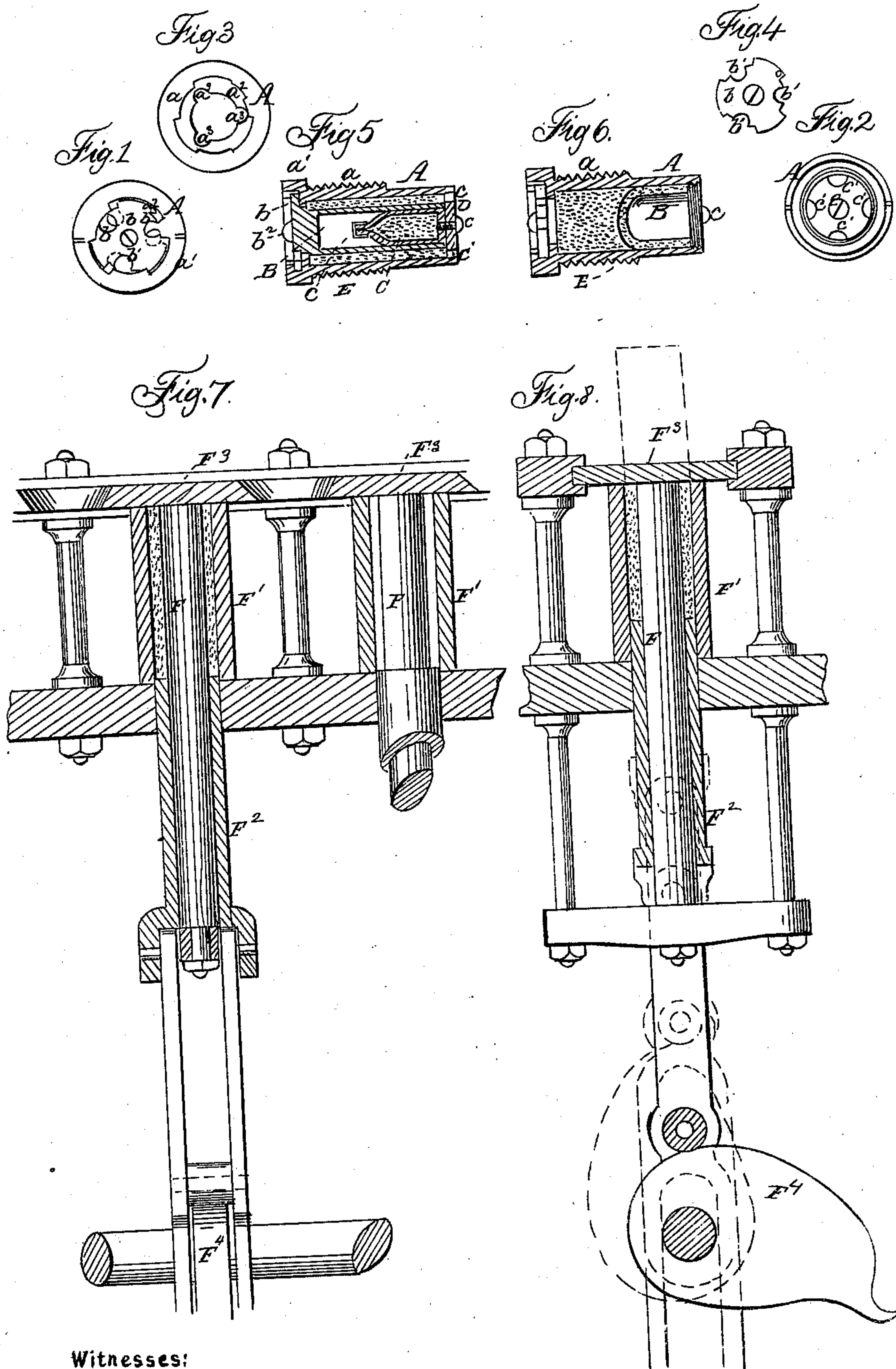


C. W. STAFFORD.

Shell-Fuse.

No. 44,023.

Patented Aug. 30, 1864.



Witnesses:

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Inventor:

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UNITED STATES PATENT OFFICE.

CHARLES W. STAFFORD, OF NEW YORK, N. Y.

IMPROVEMENT IN COMBINED TIME AND PERCUSSION FUSES FOR SHELLS.

Specification forming part of Letters Patent No. 44,023, dated August 30, 1864.

To all whom it may concern:

Be it known that I, CHARLES W. STAFFORD, of the city, county, and State of New York, have invented a new and useful Improvement in Combined Time and Percussion Fuses; 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 front end view of my improved fuse. Fig. 2 is a rear end view thereof. Fig. 3 is a front view of the main outer shell of the fuse, as disconnected from the other parts thereof. Fig. 4 illustrates a cap which fits over the forward end of the main outer shell. Figs. 5 and 6 are longitudinal central sections of the fuse entire. Figs. 7 and 8 illustrate a machine for making the powder-cylinders hereinafter described.

Similar letters of reference indicate corresponding parts in the several figures.

This invention relates to a fuse of novel construction, in which means are provided for exploding a percussion-fuse or adapting a time-fuse to become ignited by the gases produced by the explosion of the projecting-charge, all as will be hereinafter more fully explained. This fuse is designed to be employed in connection with shells of any suitable construction, and constitutes an unfailing medium for producing the explosion thereof.

In order that others skilled in the art to which my invention appertains may be enabled to fully understand and use the same, I will proceed to describe its construction and operation.

In the accompanying drawings, A represents a metallic fuse tube or cylinder.

B is a tube placed within the fuse-tube A, in the manner shown, and fitting over a nipple-shaped stem or plunger, C, the latter being attached by means of a small screw, *c*, to the cap D, which closes the rear end of the fuse-tube A, and which cap D is provided with apertures *c'*, whereby communication is afforded between the interior of the fuse and the shell to be exploded.

In the annular front end, *a'*, of the shell A is formed a cavity or receptacle, *a²*, for a corresponding cap, *b*, which may be a part of or securely attached to the end of the tube B. The cap *b* is formed with three or more wings or projections and a corresponding number of

apertures, *b'*, which latter may, by the turning of the cap *b*, be brought into contraposition or communication with the apertures *a³* in the fuse-tube A; or the cap *b* may be turned so as to entirely close the apertures *a³*. By means of a check, *a⁴*, the closed condition of the cap may be readily indicated. The object in thus opening and closing communication with the interior of the fuse at the front end of the shell A will be presently explained.

On the end of the plunger C is placed a common percussion cap or primer, *c²*, which is adapted to ignite powder contained within the plunger C, as indicated in Fig. 5. The screw *c* is of sufficient strength to retain the plunger in contact with the cap D during transportation, and at all other times excepting when the shell is fired. When the shell strikes the object at which it may be fired, the momentum of the plunger C will cause it to break the threads of the screw *c*, and thereby becoming detached from the cap D the plunger C advances, and its forward end impinges against the end *b²* of the tube B, which produces the explosion of the cap *c²*. When the powder within the plunger C is ignited, the interior of the latter is in direct communication with the interior of the explosive shell through the aperture from which the screw *c* may be blown.

Between the fuse-tube A and the inner tube, B, is placed a cylindrical body of compressed meal-powder, E, which, when ignited, may communicate combustion to the powder within the shell to be exploded, through the apertures *c'*.

Operation: When the shell is to be fired, the cap *b* is turned so as to open communication with the interior of the fuse through the apertures *b' a³*, in the manner described. When the charge in the gun is exploded, the gases passing around to the front of the shell in which the cylinder or fuse may be inserted enter the openings *b' a³*, and ignite the powder-cylinder E, which may be formed to burn as long as desired, so as to explode the shell at the proper time. The cap *c²*, in connection with the hollow plunger C, serves to explode the shell instantaneously when the latter strikes; but in case of its failure from any cause the powder-cylinder E will insure the explosion of the shell at any period at which the fuse may be set.

Figs. 7 and 8 are representations of a ma-

chine for making the meal-powder cylinders E, which, after being made in the form represented, are inserted between the cylinder A and tube B, said powder-cylinder being retained in position by the cap D and the flanges against which the cap *b* bears. This machine consists, essentially, of mandrels F, mounted within a frame and encircled by stationary cylinders F' and movable cylinders F², the cylinders F² being adapted to slide within the cylinders F', respectively, as indicated more clearly in Fig. 8, and thereby compress the meal-powder, which may be placed around the mandrels F, between the upper ends of the cylinders F² and a board, F³, which latter may be renewed to allow the powder-cylinders, after their formation, to be forced entirely out of the cylinders F' by the elevation of the cylinders F².

The cylinders F² may be elevated by means of an eccentric, F⁴.

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

1. The combination, in one fuse, of the following elements, to wit: first, the annular chamber E, extending from front to rear of the fuse, to contain a time composition; second, the apertures *c'*, affording communication between the said chamber and the interior of the shell; and, third, the nipple-plunger B, surrounded by and adapted to slide within the chamber E, the said parts being arranged to operate as herein specified.

2. The cap *b*, provided with the apertures *b'*, which operate in connection with the apertures *c'*, in the manner described, so as to adapt the time-fuse E to be ignited by the windage, or to be closed from communication therewith, as and for the purposes specified.

The above specification of my improvement in percussion and time fuses, signed this 27th day of May, 1864.

C. W. STAFFORD.

Witnesses:

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