

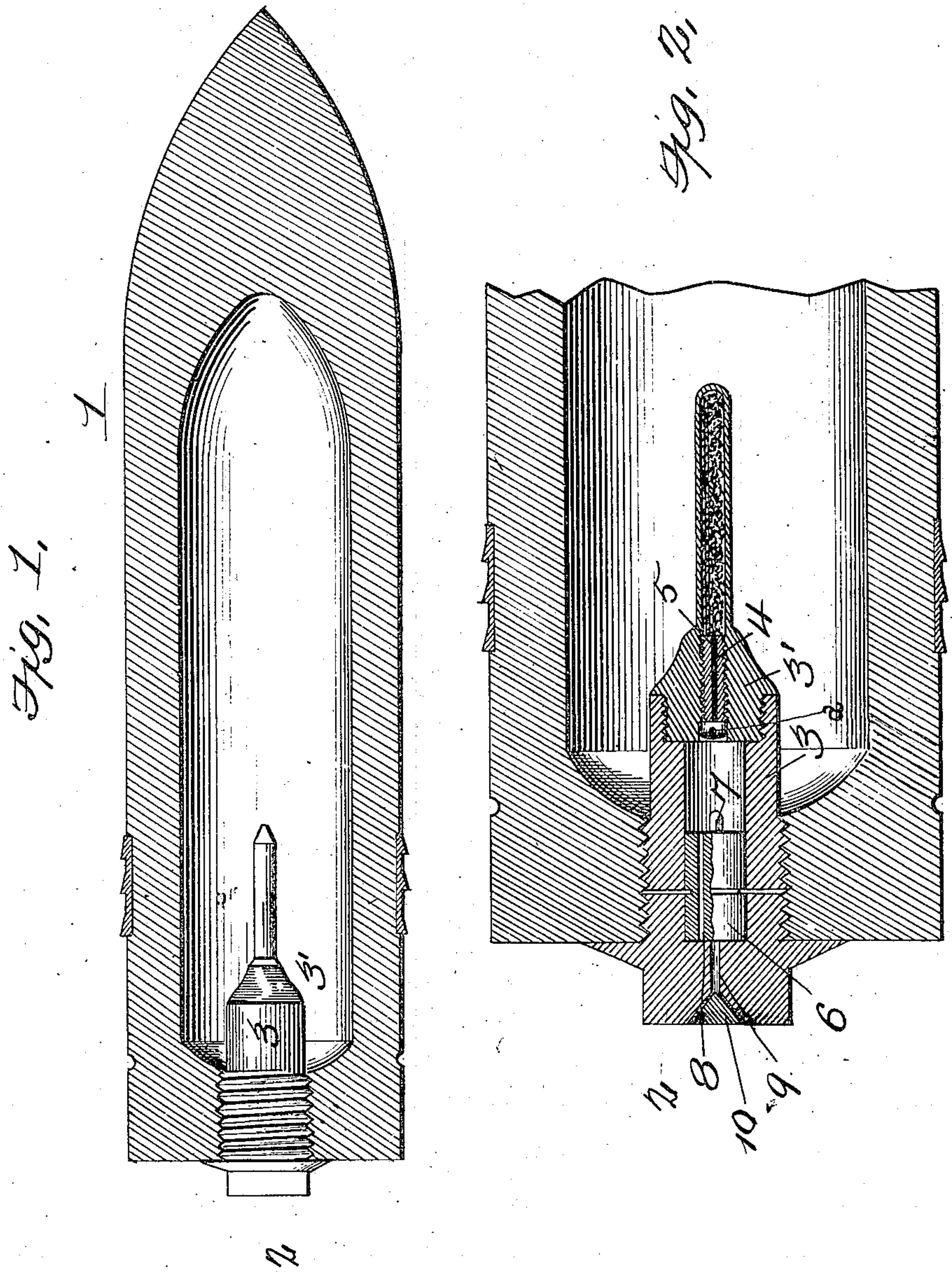
No. 612,494.

Patented Oct. 18, 1898.

G. M. HATHAWAY.  
SHELL FUSE.

(Application filed Feb. 12, 1896. Renewed Mar. 17, 1898.)

(No Model.)



WITNESSES:

*Geo. M. Hathaway*  
*Witness*

INVENTOR

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# UNITED STATES PATENT OFFICE.

GEORGE M. HATHAWAY, OF NEW YORK, N. Y., ASSIGNOR TO M. C. ARNOT  
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## SHELL-FUSE.

SPECIFICATION forming part of Letters Patent No. 612,494, dated October 18, 1898.

Application filed February 12, 1896. Renewed March 17, 1898. Serial No. 674,260. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE M. HATHAWAY, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Shell-Fuses; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to shells or projectiles, and is designed to improve the fuse of that class of shells in which a high-explosive compound is employed to explode the shell; and it consists in the general construction and arrangement of the several parts of the fuse, as will be hereinafter more fully described and claimed.

One of the principal objects of the invention is to provide for the explosion of the shell after it has entered or passed through the object at which it is fired.

A further object of the invention is to provide for the escape of the gases arising from the explosion of the percussion-cap and the burning of the time-fuse material.

A still further object of the invention is to improve the detonator, and generally to provide for protecting the high-explosive charge from accidental or premature explosion.

These objects are attained by the means illustrated in the accompanying drawings, in which—

Figure 1 is a longitudinal sectional view of a shell, showing my improved fuse and detonator in full line in proper position; and Fig. 2, a longitudinal section of the fuse and detonator.

Referring specifically to the figures, the numeral 1 indicates a shell suitably chambered to contain a high-explosive compound and apertured at its rear end to receive the fuse.

The numeral 2 indicates a fuse, which consists of a cylindrical body portion 3, which is screwed into the end aperture of the shell, and a tube closed at one end and having its other end provided with a flanged head 3', which is cut with left-hand screw-threads, to be received into the screw-threaded end of the body of the fuse. The bore of the tube, a short distance from its outer end, is screw-

threaded a suitable distance to receive a screw-threaded plug 4, which is provided with a longitudinal bore 5 of small diameter and is for convenience designated as the "time-fuse" plug. The detonator is charged with a low-grade detonating compound of the kind described in an application filed by me February 14, 1896, Serial No. 579,266, and which is incapable of being exploded by any other means than by a flame. After the detonating material has been put into the detonator the time-fuse plug, which has been previously packed with a suitable "priming," is then screwed into position and an anvil percussion-cap seated in the small chamber at the outer end of the plug.

The body of the fuse is chambered to receive and normally hold in fixed position a striker 6, provided with a firing-pin 7, which when the striker is released from its fixed position is adapted to strike and explode the percussion-cap. The striker is provided with a longitudinal bore 8, through which the gases arising from the explosion of the percussion-cap and burning time-fuse or retarder are permitted to escape, the percussion-cap being provided with a perforation *a* to allow said gases to pass through said bore. Leading from the chamber to the outer end of the fuse-body is a hole 9, by means of which the gases are permitted to escape into the open air. The outer end of this hole is counter-sunk to receive a conical plug 10, which is held in place by means of soft solder. When the shell is fired from the gun, the soft solder is caused to melt, and when the percussion-cap is exploded the gas escaping through the perforations in the cap and through the longitudinal bore of the striker blows out the plug, thus permitting the gas to escape into open air, and thereby preventing any explosive action of the gases which might tend to affect or disturb the detonating material or to so impair the time-fuse or retarder as to destroy its function.

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

1. The combination with a suitably-chambered shell, of a fuse comprising a chambered cylindrical body having its inner end screw-



threaded to receive the screw-threaded end  
of a detonator-tube, a time-fuse plug screwed  
in the open end of the tube and provided with  
a percussion-cap, and a normally-fixed striker  
5 adapted to explode the percussion-cap upon  
impact, substantially as specified.

2. The combination with a suitably-cham-  
bered shell, of a fuse comprising a chambered  
body having its inner end screw-threaded and  
10 its outer end perforated and fitted with a con-  
ical plug, a detonator carrying a time-fuse fit-  
ted with a perforated percussion-cap, and a  
temporarily-restrained striker provided with  
a longitudinal bore, whereby the gases are  
15 permitted to escape through the end of the  
fuse.

3. The combination with a suitably-cham-  
bered shell, of a chambered plug or body  
adapted to be screwed into the rear end of  
the shell, a detonator-tube screwed in the in- 20  
ner end of said plug or body, means for ex-  
ploding the detonator, and a time-fuse or re-  
tarder interposed between the detonator and  
the means for exploding the same, whereby  
the shell is exploded after it has entered or 25  
passed through the object at which it is fired.

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

GEORGE M. HATHAWAY.

Witnesses:

J. R. NOTTINGHAM,  
L. L. JOHNSON.