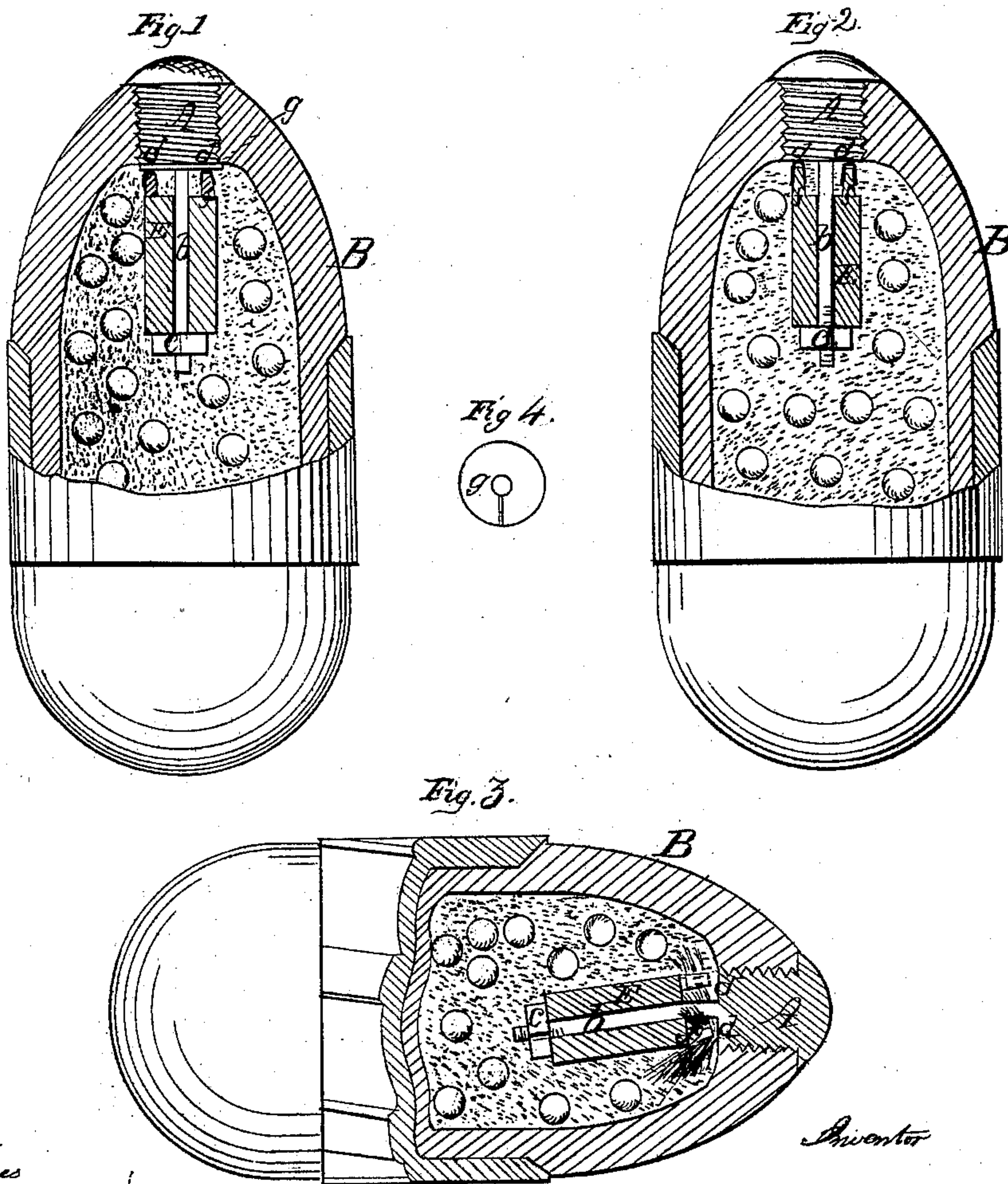


J. M. CONNELL.
Shell.

No. 37,566.

Patented Feb. 3, 1863.



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UNITED STATES PATENT OFFICE.

J. M. CONNEL, OF NEWARK, OHIO.

IMPROVEMENT IN PERCUSSION-EXPLODERS FOR SHELLS.

Specification forming part of Letters Patent No. 37,566, dated February 3, 1863.

To all whom it may concern:

Be it known that I, JAMES M. CONNEL, of Newark, in the State of Ohio, have invented a new and Improved Shell-Exploser; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawings and the letters of reference marked thereon—like letters in the several figures indicating the same parts—and in which drawings—

Figures 1 and 2 are views showing my shell-exploder in proper position within a shell, either for transportation or immediate use, as may be desired. Fig. 2 shows the action of the exploder when the shell strikes its side against a resisting object instead of its forward end.

The object of my invention is to provide a shell with an exploder which, when inserted within the shell, will allow of a safe transportation of the latter, and which exploder will act without failure in causing an explosion, not only when its forward point strikes a resisting object, but also when from a long range the shell falls flatly on the field, or in such manner as to cause it to ricochet.

As shown in the figures, A indicates a screw-plug, in rear of which a plunger-rod, *b*, projects, the whole being constructed of one piece of metal, though they may be made of separate pieces, and in any proper manner secured together. The rear portion or end of rod *b* terminates with a screw-thread, as indicated, for the reception of a screw-nut, *c*, between which nut and the shoulder *d* of the screw-plug a metallic plunger, E, is confined, as represented. The plunger E may be either cylindrical or square, and centrally of its length is perforated to properly fit and slide upon the rod *b*, and on its forward end is provided with three or more nipples, *f*, which nipples may be cast upon and with the body of the plunger. These nipples are intended to receive percussion-caps, as represented in the drawings, which caps may be made to come in contact with a leather disk, *g'*, interposed between them and the shoulder *d* of the screw-plug A, as shown in Fig. 1; or they may be made to bear directly against the rear of the screw-plug, as shown in Fig. 2. Fig. 4 shows a plan of this disk *g'*, it being provided with a slit

from center to periphery, in order to allow it to be adjusted readily upon the rod *b* without passing the disk lengthwise over said rod. Thus, when the disk is in position as shown in Fig. 1, it may readily be removed by simply easing the nut *c*, and then drawing upon it in a direction at right angles with the rod *b*. In Fig. 1, I have shown this disk inserted between the percussion-caps and the screw-plug A, the plunger being screwed up, so as to give the nipples and caps and disk a steady bearing against the rear portion or shoulder *d* of the screw-plug. In such position the shell may be transported and handled with little danger of a premature explosion, the function performed by the disk *g'* being to prevent the explosion of the caps while the shell is being subjected to the ordinary jar and handling incident to its manipulation previous to its being fired from the cannon.

I have found from actual experiment that the disk may remain in position, as shown in Fig. 1, when the shell is fired off and still incur no risk of a failure to cause an explosion of the shell; but to secure with unerring certainty the desired explosion, it may be well to withdraw the disk just before firing, and adjust the plunger so that the caps shall abut against the screw-plug, as shown in Fig. 2. In such last-named position the shell, after being fired off, if it strikes its forward end against a resisting object, will, by the concussion, cause the explosion of all the caps upon the plunger. If however, it should, owing to long range, fall "flatly," so to speak, upon the ground, or in such manner as to cause the shell to ricochet, the force of the blow upon the ground will be such as to cause the stem or rod *b*, which supports the plunger, to be bent down, as indicated in Fig. 3, thus bringing at least one of the caps in contact with the shoulder *d* of the screw-plug with a sudden leverage concussion, and so insuring the explosion of the same, as clearly indicated in said last-named figure.

By thus constructing and applying a shell-exploder to a shell, B, I dispense with the plunger-tubes ordinarily used, economize room in the interior of the shell, and at the same time secure the explosion of the shell under circumstances where the ordinary shell-exploders do not effect such result.

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The disk *g'* may be made of leather, rubber, felt, or any other like yielding material.

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

1. Suspending a plunger upon a projecting stem, *b*, of the screw-plug A, in the manner and for the purpose set forth.

2. So applying a shell-exploder to a shell that when the latter strikes obliquely or side-

wise the said exploder shall be ignited by a leverage impact against the rear of the screw-plug, in the manner substantially as described.

Witness my hand in the matter of my application for patent on shell-exploder this 27th day of September, A. D. 1862.

J. M. CONNEL.

Witnesses:

ALONZO P. TAYLOR,

JOHN CONNEL, Jr. .