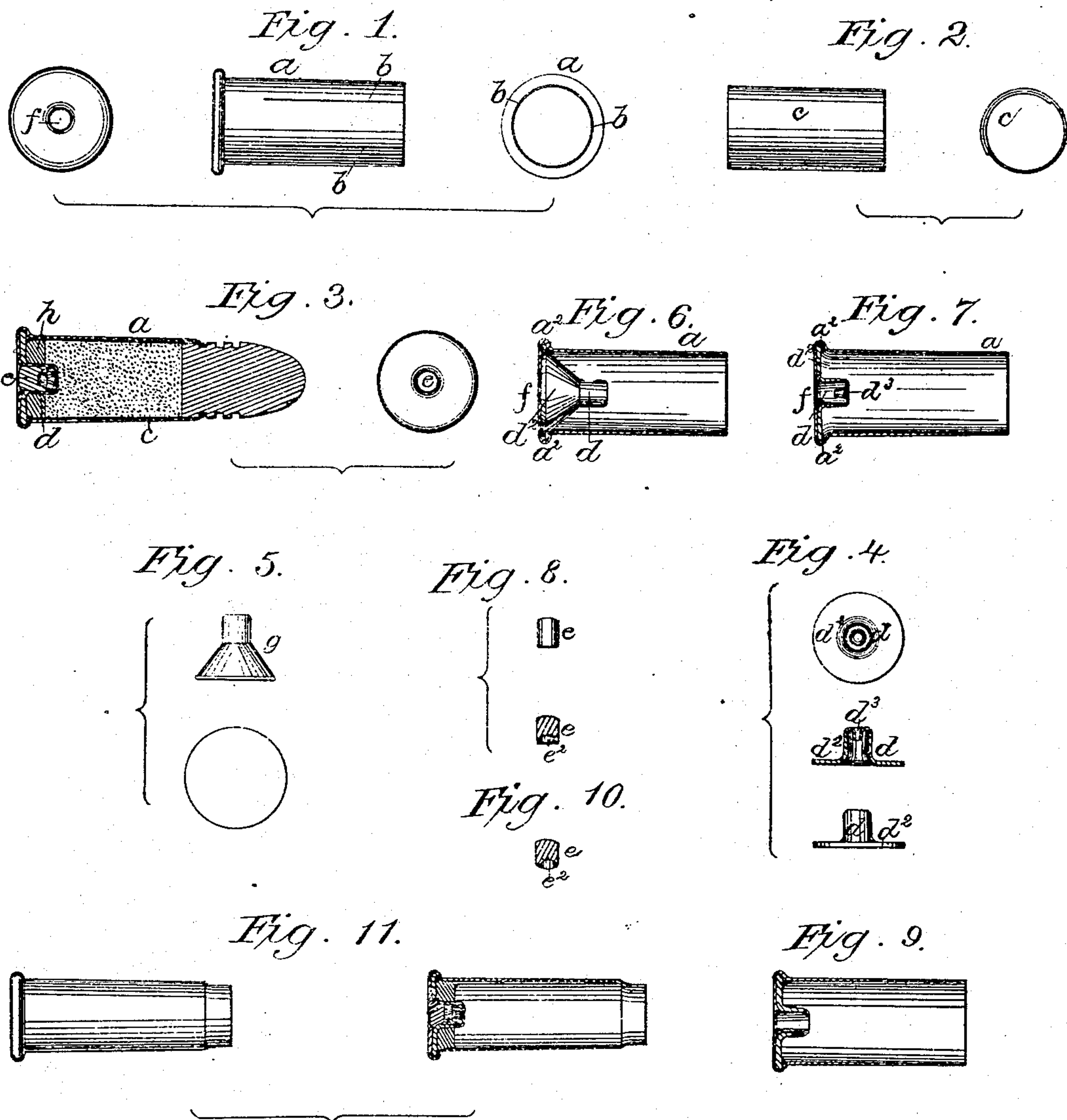


Abraham & Bayliss, Cartridge.

No 83,434.

Patented Oct. 27, 1868.



Witnesses:
George Shaw
Richard Kerrett

Inventors
John Abraham
Thomas Richard Bayliss

UNITED STATES PATENT OFFICE.

JOHN ABRAHAM AND THOMAS RICHARD BAYLISS, OF BIRMINGHAM,
ENGLAND.

IMPROVEMENT IN CARTRIDGES.

Specification forming part of Letters Patent No. **83,434**, dated October 27, 1868; patented in England
March 20, 1868.

To all whom it may concern:

Be it known that we, JOHN ABRAHAM, of Birmingham, in the county of Warwick, England, machinist, and THOMAS RICHARD BAYLISS, of Birmingham aforesaid, machinist, subjects of the Queen of Great Britain, have invented or discovered new and useful Improvements in Central-Fire Cartridges for Breech-Loading Fire-Arms; and we, the said JOHN ABRAHAM and THOMAS RICHARD BAYLISS, do hereby declare the nature of the said invention, and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement thereof—that is to say:

In constructing the said cartridges we form the cases or shells of sheet metal, or of metal and paper, or of metal and other flexible non-metallic material. In making the said cases or shells of metal, we draw them solid from a disk, or cut them in proper lengths from tubes. We make a series of incisions in the metal cases or shells, the said incisions being either parallel to the axis of the case or shell, or oblique thereto, or situated in a helical direction. The said incisions permit the case or shell to expand on firing, thereby preventing the escape of gas. After discharge, the case or shell contracts, and the empty case is readily extracted from the fire-arm. A thin metallic or other lining may be used to more effectually prevent the escape of gas. An inner or percussion chamber for holding the percussion-pin hereinafter described is situated at the base of the cartridge and in its axis. It consists of a cup formed in the middle of a blank or disk of metal, which disk is fixed in the rim of the case or shell, being held firmly between the two sides of the said rim. The bottom of the percussion-chamber is convex internally, and constitutes an anvil for the percussion-pin to strike against. A separate anvil is thereby rendered unnecessary. The bottom of the percussion-chamber may, however, be made flat. The said convex bottom of the percussion-chamber is pierced with a small hole for the fire or flash to pass through to the gunpowder of the cartridge. The base of the case or shell is pierced with a hole, the edge of which may

be plain; or it may be turned inward upon the percussion-chamber, which turning inward of the edge tends to prevent the escape of gas. The percussion-pin is a solid piece of metal or wire, of a size proper to fit the percussion-chamber—that is, about the size of a percussion-cap. The inner end of the percussion-pin is made concave, and in the concavity the charge of fulminate is put. The primed percussion-pin is inserted, through the hole in the base of the cartridge, into the percussion-chamber in the said base, which chamber it fits accurately, the fulminate coming nearly in contact with the convex bottom of the percussion-chamber. When the percussion-pin is struck by the hammer or striker of the fire-arm, its primed end strikes against the convex bottom of the percussion-chamber and ignites the cartridge. We employ a wad in the base of the cartridge, which wad is of the ordinary kind, and is inserted in the cartridge in the usual manner.

Having explained the nature of our invention, we will proceed to describe, with reference to the accompanying drawing, the manner in which the same is to be performed.

Figure 1 represents a side elevation and elevations of the base and front end of a metallic case or shell for a central-fire cartridge, provided with a series of incisions, according to our invention. The said incisions are marked *b*, and are made parallel to the axis of the said case or shell *a*, and extend about half-way along the case or shell. We do not limit ourselves to the length or number of the said incisions. By means of these incisions the case or shell is capable of expanding on the discharge of the cartridge, and thereby preventing the escape of gas, while, after discharge, the said case or shell contracting permits the empty case to be readily removed from the barrel. Although we find that longitudinal incisions, or incisions parallel to the axis of the case or shell, answer satisfactorily, yet the incisions may be made oblique to the axis of the case or shell, or in a helical direction; or the incisions may be only partly cut through, so that the explosion may burst the case or shell.

Figure 2 represents a thin metallic or other lining, which may be used in the case or shell to more effectually prevent the escape of gas. The open or unjointed edges of the said lining overlap one another, and the lining is thereby enabled to expand and contract.

Fig. 3 represents a longitudinal vertical section and elevation of the base of a complete central-fire cartridge containing our several improvements. In the said Fig. 3 the case or shell provided with incisions is marked *a*, the thin metallic lining is marked *c*, the inner or percussion chamber in the base of the cartridge is marked *d*, and the percussion-pin, situated in the same chamber, is marked *e*.

The percussion-chamber *d* is shown separately in elevation, section, and plan in Fig. 4; and the percussion-pin is shown separately in elevation, section, and plan in Fig. 8. The percussion-chamber consists of a cup, *d*, formed in the middle of a blank or disk of metal, *d*².

The manner in which the percussion-chamber *d* is made from the disk of metal will be understood by referring to Fig. 5, which represents the metal blank or disk and the percussion-chamber in its several stages of manufacture. The bottom of the cup or chamber *d* is convex inward, as represented, and in the middle of the said convex bottom is a hole, *d*³, through which the fire or flash passes.

The manner in which the percussion-chamber *d* *d*² is fixed in the base of the cartridge-case will be understood by referring to Figs. 6 and 7.

After a hole, *f*, has been pierced in the base of the case or shell, the percussion-chamber *d* *d*², having the conical shape represented at *g*, Fig. 5, is introduced, mouth-forward, into the shell or case *a*, and made to take the position represented in Fig. 6.

By means of a pressing-tool of the proper shape, introduced into the case or shell, the conical sides *d*² of the chamber are flattened, and the edges of the flattened disk thereby made to enter the space between the sides of the rim *a*² of the case or shell *a*, as illustrated in Fig. 7. The disk *d*² of the percussion-chamber *d* is thus firmly held between the rim of the case or shell.

Instead of fixing the percussion-chamber *d* *d*² in the base of the case or shell by the rim of the said case, as described and illustrated, an annular groove or depression may be made in the inner side of the base of the case or shell, into which the edges of the disk of the percussion-chamber may be pressed, in the manner described.

The edge of the hole *f* in the axis of the base of the cartridge may be turned inward upon the percussion-chamber to assist in preventing the escape of gas.

The percussion-pin *e* consists of a solid piece of metal or wire, of a size proper accurately to fit the hole *f* in the base of the cartridge-case *a* and the interior of the percussion-chamber *d*, and slightly enlarged at its base, so as to

close tightly the chamber. The inner end of the percussion-pin *e* has a concavity, *e*², in it, in which the charge of fulminate is put. The pin *e* is introduced through the hole *f* into the percussion-chamber *d*, and is made to occupy the position in the said chamber represented in Fig. 3—that is, its primed end *e*² is situated nearly in contact with the convex bottom of the percussion-chamber *d*.

A wad, *h*, is inserted in the base of the cartridge, and the cartridge is completed in the ordinary manner.

On the percussion-pin *e* being struck by the hammer or striker of the fire-arm its primed end *e*² strikes against the convex bottom of the percussion-chamber *d* and ignites the fulminate in the said pin, the flash or fire from which passes down the hole *d*³ in the said anvil to the gunpowder of the cartridge, and discharges the said cartridge.

By constructing cartridges according to our invention the fulminate of the percussion-pin is ignited at the bottom of the percussion-chamber, and close to the gunpowder of the cartridge, and the risk of miss-fire is thereby reduced.

Fig. 9 represents, in section, a shell or case, with a percussion-chamber having a flat bottom, instead of the convex bottom represented in Figs. 3 and 7.

When the percussion-chamber has a flat bottom, the ignition of the fulminate in the percussion-pin takes place between the said flat bottom and the percussion-pin.

Instead of making the edges of the percussion-pin flat, they may be slightly cupped inward, as represented in Fig. 10.

Fig. 11 represents, in elevation and section, a case or shell of less diameter and more taper than that already described and represented, which we sometimes employ.

Although we prefer to use a wad in the base of the cartridge, yet cartridges made according to our invention may be used without a wad in the base; and although we prefer to use, in combination with the other parts of our invention, a case or shell provided with incisions, yet a plain case or shell may be used.

In the drawing we have only represented a cartridge having a metallic case or shell; but our improved percussion-chamber and percussion-pin may also be applied to cartridges in which the cases or shells are made partly of metal and partly of paper or other flexible non-metallic material.

Having now described the nature of our invention, and the manner in which the same is to be performed, we wish it to be understood that we do not limit ourselves to the precise details herein described and illustrated, as the same may be varied without departing from the nature of our invention; but

We claim as our invention-of improvements in central-fire cartridges for breach-loading fire-arms—

1. Making a series of longitudinal, oblique,

or helical incisions in the metallic cases or shells of the said cartridges, for the purpose and substantially as hereinbefore described, and illustrated in the accompanying drawing.

2. The construction, substantially as herein described, of the percussion-chamber, by forming the same, as shown and set forth, of a blank independent from the cartridge-case, and securing it in the rim of the case, as herein described.

3. The combination, with a cartridge-case provided with a percussion-chamber con-

structed as described, of a primed percussion-pin enlarged at its base, so as to close tightly the said chamber, substantially as herein set forth.

JOHN ABRAHAM.

THOMAS RICHARD BAYLISS. [L. S.]

Witnesses:

GEORGE SHAW,

7 Cannon Street, Birmingham.

RICHARD SKERRETT,

7 Cannon Street, Birmingham.