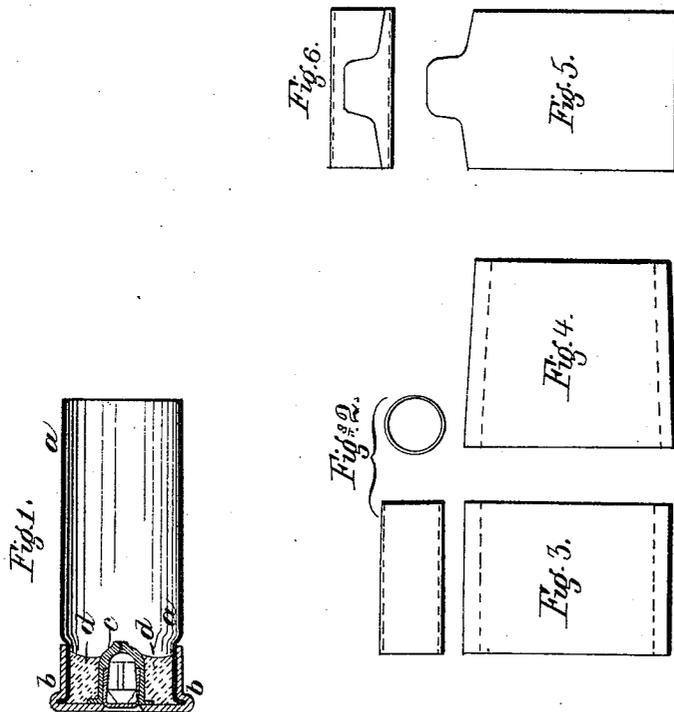


G. H. DAW.

Cartridge.

No. 89,563.

Patented May 4, 1869.



Witness  
Samuel Stearns,  
William Chapman.

G. H. Daw

# UNITED STATES PATENT OFFICE.

GEORGE H. DAW, OF LONDON, ENGLAND.

## IMPROVEMENT IN CARTRIDGES.

*Specification forming part of Letters Patent No. 89,563, dated May 4, 1869.*

*To all whom it may concern :*

Be it known that I, GEORGE HENRY DAW, of Threadneedle street, in the city of London, England, a subject of the Queen of Great Britain, have invented or discovered new and useful Improvements in the Construction of Cartridges for Breech-Loading Fire-Arms; and I, the said GEORGE HENRY DAW, 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 :

This invention has for its object improvements in the construction of cartridges for breech-loading fire-arms. Cartridges for breech-loading fire-arms have heretofore, in some cases, been made with the case which is to contain the powder formed of a tube of metal. The tube has either been a drawn tube, or it has been a tube or hollow roll formed by winding sheet metal around a mandrel. Such metal tubes have also, at one of their ends, been combined with a base, (mainly composed of paper or pulp, and formed by the process known as Daw's process,) carrying in its center a percussion arrangement for igniting the powder. According to my invention, I construct the case of the cartridge of a metal tube formed from a strip of thin rolled sheet metal bent over a mandrel, and having its overlapping edges soldered together, so as to form a perfect tubular body, which is combined with a cup-base or capsule holding the percussion arrangement, and with a wad of paper-pulp at the base, so that the thin tubular body is closed at one end by a strong base, (composed of the capsule and paper wad,) and at the other by the projectile. This mode of constructing the cartridge enables the body to be constructed of very thin metal, while the base is exceedingly strong; hence much less metal may be employed in forming the case than heretofore. The empty cases are also very readily extracted from the chamber of the barrel after the cartridge has been exploded.

The tubes are of conical or cylindrical form, or conical and cylindrical combined. The tubes or cases of other descriptions of metallic cartridges may also be constructed in a similar way to that above described.

Having thus described the nature of my

invention, I will proceed to describe more fully the manner of performing the same.

Figure 1 shows a longitudinal section of a cartridge, with the case which is to contain the powder formed from thin sheet metal, soldered up at its edges to form a tube, *a*, as above described. One end of this tube *a*, forming the powder-case, is shown to be combined with a base formed by the process known as Daw's process, and carrying a percussion arrangement for igniting the powder. *b* is the base-cup or capsule, into which the tube *a* is set. *c* is the "hat-cap," or chamber to contain the percussion-cap and anvil, and *d* is a wad of paper-pulp forced in under a heavy pressure while the cartridge-case is inclosed in a strong case or mold. It renders the base of the cartridge solid, and connects the parts *a*, *b*, and *c* firmly together.

At Fig. 2 is shown separately a side and end view of a tube formed by soldering up into a tube a strip of thin rolled sheet metal. The strip of metal from which such a tube is formed is shown separately at Fig. 3.

If it be desired to make the tube which is to form the powder-case of a taper form, then the shape into which the sheet metal is cut is varied accordingly. Thus, Fig. 4 shows a strip of metal suitable for making a taper tube. When the sheet metal has been cut into pieces each suitable for forming a tube, the edges which are to be connected together are coated with solder, the solder at one edge being applied on one side of the sheet, while at the opposite edge it is applied on the opposite side of the sheet, so that when the sheet is lapped around a mandrel the surfaces coated with solder may overlap and come in contact with one another. The coated edges are then caused to unite by passing a heated iron along the joint, and the strip of sheet metal is thus formed up into a tube. When forming cylindrical tubes a long strip of metal may be coated along its edges with solder, and afterward cut up into lengths of the dimensions required for forming a tube.

It is not essential that the tubular powder-cases should be soldered up from end to end. Thus, as is represented at Fig. 5, the strip of metal may be cut with a projecting flap. It is rolled up into a tube, as is shown at Fig. 6, and the flap only is secured by solder.

In making up a cartridge from a tube formed as above described, one end of the tube is combined with a base, and afterward the tube forming the powder case has placed into it the requisite quantity of powder, and the mouth of the case is then closed up by the projectile.

A portion of the rear end of the projectile, by preference, is inserted into the tube and held there, either by bending in or indenting the tube into grooves in the projectile, or by cementing the bullet into the case with wax or other lubricating material.

Having thus described the nature of my invention, and the manner of performing the

same, I would have it understood that what I claim is—

The construction of the cartridge-case with a tubular body composed of a strip of thin sheet metal soldered at its overlapping edges, and combined with a base-cup containing the percussion arrangement and a wad or filling of paper-pulp, as hereinbefore set forth.

GEORGE H. DAW.

Witnesses:

G. F. WARREN,

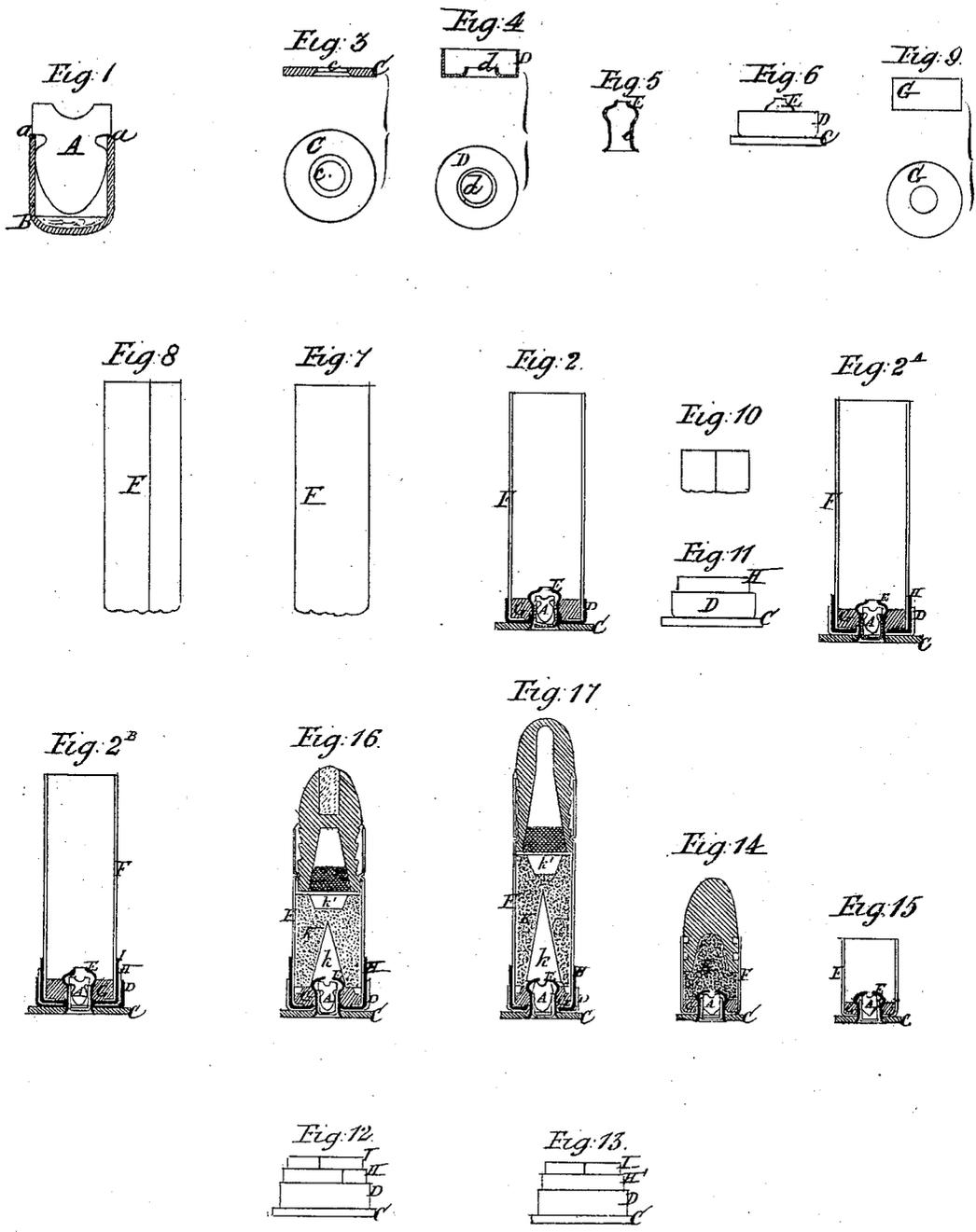
JOHN DEAN,

*Both of No. 17 Gracechurch Street,  
London, E. C*

E. M. BOXER.  
METALLIC CARTRIDGE.

No. 91,818.

Patented June 29, 1869.



Witnesses  
*[Signature]*  
*[Signature]*

*[Signature]*

# United States Patent Office.

EDWARD MOUNIER BOXER, OF THE ROYAL ARSENAL, WOOLWICH,  
ENGLAND.

Letters Patent No. 91,818, dated June 29, 1869; patented in England, October 13, 1866.

## IMPROVEMENT IN METALLIC CARTRIDGES.

The Schedule referred to in these Letters Patent and making part of the same.

### To all whom it may concern:

Be it known that I, EDWARD MOUNIER BOXER, of the Royal Arsenal, Woolwich, in the county of Kent, England, Colonel Royal Artillery, have invented an "Improved Cartridge for Breech-Loading Fire-Arms;" and I do hereby declare that the following is a full and exact description of the said invention, reference being had to the accompanying drawing, and to the figures and letters marked thereon; that is to say—

My invention has reference, first, to an improved form and arrangement of the anvil for central-fire breech-loading cartridges generally, whereby the liability of the cartridge to explode, when accidentally dropped, or subjected to any other blow than by the striker of the fire-arm, is obviated. In the arrangements heretofore employed, the anvil has been made of such a form, that if the cartridge were subjected to a sufficiently sharp blow, it could pass, more or less, entirely into the percussion-cap, so as to strike against the fulminating-compound, and thus explode the cartridge.

Now, my improvement consists in forming shoulders or projections of such a form on the sides of the anvil, that when the anvil is inserted into the cap, they rest against the edge of the latter, and thus prevent the anvil from passing further into the cap under any circumstances, the point of the anvil being then in such a position that it is impossible for it to cause the ignition of the fulminating-compound, except when the back of the cap is indented by the striker on firing.

My invention consists, secondly, in forming the base of the cartridge of a solid metal disk, and in securing the body of the case to this disk in the following manner: The flanged cap-chamber—that is to say, the flanged tube which contains the cap and anvil, or other means of ignition—has one or more cannelures or flanges formed upon its exterior surface. The rear end of the body of the cartridge, whether of paper alone, or of metal alone, or of paper, calico, linen, or other similar material, combined with metal, is turned over upon the wad, which forms the bottom of the body. This wad, when condensed, enters into the cannelures of the cap-chamber, and, at the same time, jams the turned-over portion of the body between its bottom surface and the surface of the metal disk, thus securely fastening the metal disk, the cap-chamber, and the body of the cartridge together. The wad I sometimes make of an alloy of lead and antimony, or lead and tin, or an alloy of a similar character, and of a cup-shape, so that the explosion of the charge readily expands the edges of the cup, and thus prevents the gas from passing down the sides of the case.

The above-described arrangement is applicable to blank ammunition, and to cartridges which have not

to sustain any severe strain. In ball-ammunition, I prefer to strengthen the bottom of the body of the cartridge by means of a thin metal cup, which fits over the end of the body. In cartridges which have to withstand a severe strain, I further strengthen the bottom of the body by means of one or more strips of thin sheet-metal, coiled on the exterior of the body, but inside the cup, which strip extends beyond the cup; and, in some cases, I employ a second cup, in place of or in addition to the strips of metal. The strip or strips of coiled metal or cup prevent the edge of the outer cup from cutting through the body of the cartridge when it is expanded on firing.

This form of charge is applicable to every description of fire-arm, and, when properly arranged, it increases the force of the charge from ten to fifteen per cent.

Having thus set forth the nature of my invention, I will now proceed more fully to describe the manner of performing the same.

Figure 1, on the accompanying drawing, shows a sectional elevation, to an enlarged scale, of the before-described shoulder-anvil A, inserted in the percussion-cap B, against the edge of which the shoulders *a a* of the anvil abut, thus preventing it from passing far enough into the cap to cause the ignition of the fulminate, which can, therefore, only be effected by indenting the cap by the action of the striker of the gun.

Figures 2 to 9 show one arrangement of my improved mode of forming the base of the cartridge. This consists of the following parts, namely: first, a metal washer, C, with a central hole, *c*, shown detached, in section and plan, at fig. 3; second, a thin metal cup, D, also having a central hole, *d*, shown detached, in section and plan, at fig. 4; third, a cap-chamber, E, shown detached, in section, at fig. 5.

These parts are fitted together, as shown in elevation at fig. 6, the cap-chamber E being passed through the holes, *c* and *d*, in the parts C and D. The body of the cartridge-case F, formed either of paper alone, as at fig. 7, or of tubular metal, or of paper, calico, linen, or other similar suitable material, combined with metal, as at fig. 8, is then inserted into the base, the rear end of the case having first been turned over a wad, G, (shown detached, in elevation and plan, at fig. 9,) as indicated at figs. 7 and 8. The case is then secured to the base, as shown in the section at fig. 2, by forming a cannelure, *e*, on the cap-chamber E, by upsetting the end thereof, into which cannelure the wad G fits, the latter being made to press firmly against the cap-chamber, and against the case F, by being condensed by pressure.

The upsetting of the end of the cap-chamber may be effected either before or after the wad is condensed.

Figure 2<sup>a</sup> shows a section of a cartridge, consisting

of the same parts described with reference to fig. 2, with the addition of a coil of thin metal, H, (shown detached at Figure 10,) turned over at the rear end, which coil is inserted between the case F and the cup D, and is made to extend beyond the edge of the latter, as shown in the detached elevation of these parts at Figure 11.

The base of the cartridge, shown in section at Figure 2<sup>b</sup>, is formed of the same parts as the cartridge fig. 2<sup>a</sup>, with the further addition of another coil of thin metal, I, extending beyond the first coil, H, as shown in the detached elevation at Figure 12. In this arrangement, I sometimes substitute a very thin cup for the first coil, as shown at H', Figure 13, in which case the base cup D is made thinner than when a coil is employed.

The object of these base coils in the cartridges, figs. 2<sup>a</sup> and 2<sup>b</sup> being principally to prevent the cutting through of the body of the case at the time of firing, (which sometimes occurs from the body expanding more readily than the base cup,) the relative thicknesses and resistance to expansion of the cups and coils must be regulated accordingly.

When the case of the cartridge consists of a solid metal tube, and where the strain is not great, as in pistol-charges, the base cups may be dispensed with, as before stated, and the case be secured by simply being turned over at the lower end, and jammed between the disk C and the wad G, as shown at Figures 14 and 15, of which fig. 14 shows a section of a pistol-cartridge, and fig. 15 shows a section of the case for the same.

Figures 16 and 17 show my improved form of compressed and recessed powder-charge for cartridges.

Fig. 16 shows a section of a rifle-cartridge of 0.577 bore, with the charge applied, and fig. 17 shows a section of a cartridge of 0.5 bore, with the same.

The construction of the cases of the cartridges is the same as before described with reference to fig. 2<sup>a</sup>

K is the powder-charge, compressed as before described, and having a deep recess, *k*, formed at its rear end, and a shallow one, *k'*, at its front end.

On firing the cartridge, the charge is ignited on the entire surface of the recess *k*.

Having now described the nature of my invention, and in what manner the same is to be performed,

What I claim, is—

1. Constructing the anvil to cartridges for breech-loading fire-arms with shoulders or projections, so formed as to abut against the edge of the percussion-cap, and thus to prevent its entering the cap to such an extent as to cause the ignition of the fulminate, except when the cap is acted upon by the striker of the gun, substantially as hereinbefore described with reference to fig. 1 on the accompanying drawing.

2. The separate flanged cap-chamber E, so made as to enclose the cap and anvil, or other means of ignition, and, at the same time, by compression of a wad, G, around the same, to secure the body of the cartridge-case to a solid metallic disk, C, with or without the intervention of a base cup, D, substantially as hereinbefore set forth.

3. Interposing one or more pieces of coiled metal or cups between the base cup and the cartridge-case, which coiled metal or cups extend beyond the edge of the base cup, substantially as and for the purposes hereinbefore described with reference to figs. 10 to 13 on the accompanying drawing.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses, this 17th day of December, 1867.

Witnesses:

E. M. BOXER.

C. D. ABEL,

THR. TAYLOR.