

(No Model.)

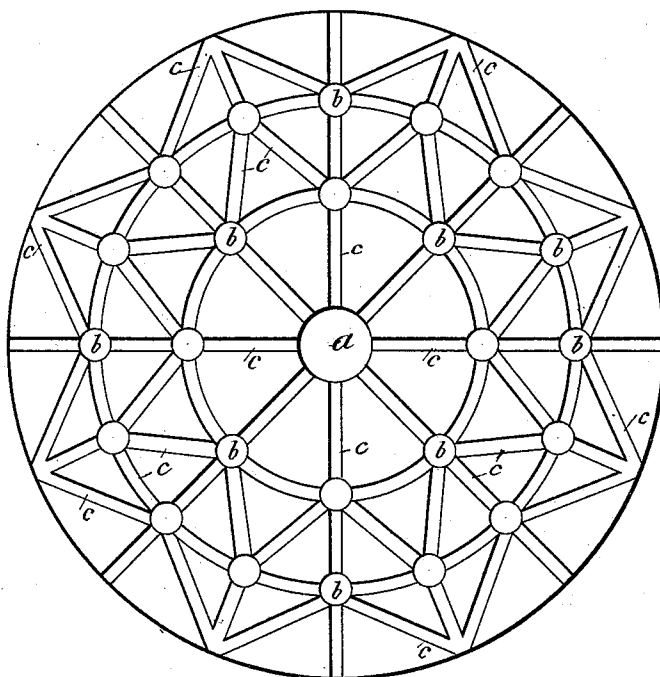
2 Sheets—Sheet 1.

G. QUICK.
CARTRIDGE FOR ORDNANCE.

No. 404,053.

Patented May 28, 1889.

Fig. 1.



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His Attys.

(No Model.)

2 Sheets—Sheet 2.

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Fig. 2.

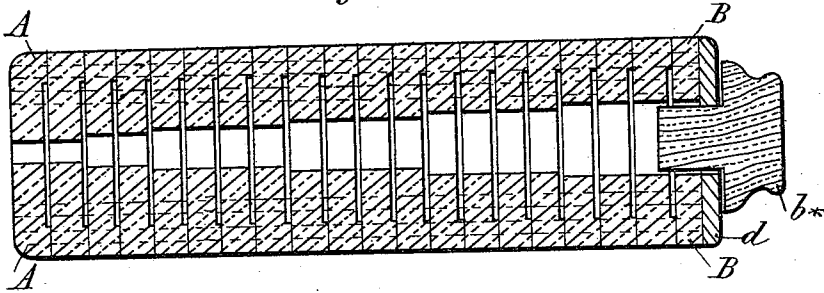


Fig. 3.

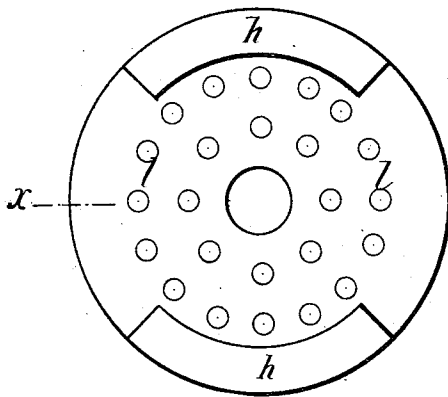


Fig. 4.

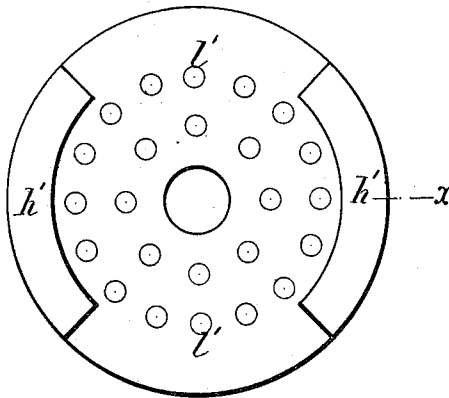
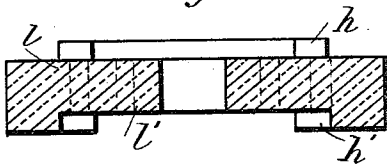


Fig. 5.



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UNITED STATES PATENT OFFICE.

GEORGE QUICK, OF CHIPPING-CAMPDEN, COUNTY OF GLOUCESTER,
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CARTRIDGE FOR ORDNANCE.

SPECIFICATION forming part of Letters Patent No. 404,053, dated May 28, 1889.

Application filed June 6, 1887. Serial No. 240,448. (No model.) Patented in England November 26, 1884, No. 15,546.

To all whom it may concern:

Be it known that I, GEORGE QUICK, a subject of the Queen of Great Britain, residing at Chipping-Campden, in the county of Gloucester, England, have invented new and useful Improvements in Cartridges for Ordnance, of which the following is a specification, and for which I have obtained protection in part in Great Britain by Letters Patent No. 15,546, dated November 26, 1884.

Figure 1 shows in elevation a powder-disk illustrating in part my invention. Fig. 2 shows a longitudinal-section of powder-disks when arranged to form a cartridge having a conical or trumpet-shaped cavity. Fig. 3 shows an elevation of one-face of a powder-disk; Fig. 4, an elevation of its opposite or reverse side, and Fig. 5 a section taken on the line *x x* of Figs. 3 and 4.

The invention relates to improvements in that class of cartridges for ordnance which are made from disks or cakes of compressed powder; and my improvements consist in forming such disks or cakes of material with a large hole in the center and with other perforations connected with each other by radial and concentric channels or shallow passages formed on the flat sides of the said cakes, so that the flame or fire from the firing-primer may spread equally and rapidly in all directions over and between the surfaces of the said cakes as well as through the perforations therein, whereby the whole cake of material, and consequently the whole of the charge, may be ignited with great rapidity and burned with great uniformity. I also construct or form the disks or rings of compressed powder with projections and recesses on their faces, so that when placed together they may interlock to prevent any sliding or twisting motion of the said disks in respect of each other, as hereinafter described. The central cavity of the cartridge formed by the said disks or rings is preferably of a conical or trumpet shape, and in this case one end of the cavity of the cartridge (by preference that end which comes next to the projectile) will be of much greater diameter than the other end of the cavity. The object of this conical cavity is to enable the charge to be more speedily and uniformly ignited and to bring the gas-pressure

to bear directly and speedily on the base of the projectile. The central hole in the disks of composition may be made somewhat in proportion to the diameter and intended length of the cartridge, and the disks may be of any required thickness—from half an inch to three, six, or more inches—and any number may be employed to form a cartridge or charge, care being taken that the said large central orifices in the disks shall be in the center or axis of the cartridge and in line with the axial vent of the gun. These disks of propelling material may be so large in diameter as to fill the chamber of the gun, or they may be, say, one-third or one-quarter or more of the diameter of the cartridge, the annular space in the cartridge surrounding the said disks being filled with any other description of powder.

The central cavity in the cake of powder which forms the rear end of the cartridge may be formed to receive a percussion primer or an electric primer by which the charge may be fired.

These disks of propelling composition may be formed of meal-powder or granulated powder, or of a mixture of meal-powder and granulated powder, subjected to great hydraulic pressure by means of suitable dies having the required projections on their faces to form the concentric and radial grooves and channels, and with the necessary pins and recesses in the said dies to form the holes or perforations in the said disks; or the cakes may be pressed flat, smooth, and solid, and the grooves afterward formed by cutting-tools and the perforations drilled through as required.

It is to be understood that the pressing of flat cakes of meal-powder for cartridges is not a new invention.

When the central orifice in the cartridge is to be conical or trumpet-shaped, I make the central cylindrical orifices of various sizes—say from half an inch in diameter up to two, three, or more inches diameter—according to the maximum external diameter of the said disks and also according to the length of cartridge required to be made; and I arrange the disks in the cartridge so that those disks which have the smallest central cylindrical

orifice shall be at the bottom or rear end of the said cartridge, and I proceed with the loading of the cartridge by adding disks having central cylindrical orifices increasing in size until the cartridge is completely loaded. For example, in loading a cartridge of six inches in diameter and twenty inches in length with disks, say, one inch thick, the two rear disks may have central orifices of half an inch in diameter, the next two disks will have central orifices of three-quarters of an inch in diameter, the next four disks will have central orifices of one inch in diameter, the next four disks will have central orifices of 1.4 inch in diameter, the next four disks will have central orifices of 1.75 inch in diameter, and the last four disks (those next the projectile) will have central orifices of two inches in diameter. I prefer to arrange the disks in this manner instead of making the holes in the disks truly conical, as the latter method would be expensive and tedious, as the holes would require reaming out to form them accurately.

To prevent disks of gunpowder for forming cartridges for ordnance from sliding one upon the other or twisting round so as to bring the small perforations therein out of line, and to give great rigidity to the whole cartridge when made up, I form recesses and projections on one side of the disks, with corresponding projections and recesses on the other side, so that the male part of one disk shall fit into and interlock with the female part of another disk, so as to prevent side play or twisting movement; but I prefer to make the center part of one side of the disks somewhat deeper than the center part of the other side, so that while the disks are in close contact at the outer edge there is a small space between the disks at the central parts to allow the flame of ignition to play freely over the surfaces. The disks at the edges may be caused to adhere together by pressure or by the use of some adhesive material.

The disk (see Fig. 1) has a central orifice and a number of other perforations connected by channels.

a shows the central orifice, *b* the other perforations, and *c* the channels connecting the perforations *a* and *b*. The longitudinal section (see Fig. 2) shows the disks as arranged to form a cartridge with a conical or trumpet-shaped cavity. In this figure, *A* indicates the disks at the rear end of the cartridge, which disks have only a small central orifice. *B* indicates the disks at the front end of the cartridge, and *d* indicates a wad of felt or other substance which is difficult to ignite. *b** is a stopper or "choke," of wood or other suitable material, around which the cartridge-bag may be secured and by the length of which the length of the whole cartridge may be accurately adjusted. The wads and chokes of wood herein described are required only in those cartridges in which great uniformity in

the length of the said cartridge is necessary. In general the whole cartridge would consist of disks of powder, no wad or choke being required, the bag being tied or sewed on in the usual manner. In this figure a small space is shown to exist between the inner parts of the disks of powder, so as to allow the flame of the primer and ignited powder to play freely over a very large amount of surface of the disks. Although no small perforations are shown in these disks, a large number of such perforations may exist.

In Figs. 3 and 4 are shown the opposite sides of the same disk with its projections and recesses for the purpose of interlocking the disks when placed together. In Fig. 3, *h* indicates the projecting or male part of the disk, and *l* the lower or female part. In Fig. 4 the corresponding parts are shown by letters *h'* and *l'*, from which it will be seen that these disks, when placed one upon the other, interlock by means of the projections *h h* in Fig. 3 fitting into the low or recessed parts *l' l'* of Fig. 4, and also by means of the projections *h' h'* of Fig. 4 fitting into the low or recessed parts *l l* of Fig. 3. By thus fitting into each other and interlocking all play of the disks upon one another is prevented. These projections and recesses for interlocking the disks may be of any shape desired, the said projections and recesses being formed by means of corresponding recesses and projections formed on the face of the dies used in pressing the disk of powder. It will be obvious that my interlocking arrangement of the disks is applicable to all kinds of disks, whether with or without a central cavity and whether such cavity be cylindrical or conical.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is—

1. A cartridge built up of a series of cakes of compressed gunpowder or other propelling composition or material, the said cakes having one large central orifice or perforation in combination with numerous smaller perforations, the said cakes having also projections and recesses formed on their faces, whereby when placed together face to face they shall interlock, not only to prevent any sliding or twisting motion of the said cakes in respect of each other, but also to bring the said small perforations in all the cakes composing the cartridge into continuous lines, as shown and described.

2. A cartridge built of a series of cakes of compressed propelling material, each having a large central orifice and sundry smaller ones, the adjacent cakes having projections and recesses whereby they shall interlock and insure the proper alignment of these smaller orifices, said cakes also having their central parts made thinner than the remaining parts, all substantially as shown and described.

3. Cakes of compressed explosive material

having numerous longitudinal perforations *a*
b through their thickness, and having inter-
locking projections and recesses in their sur-
faces, as set forth, and having numerous
5 grooves or channels *c* on their flat sides con-
necting the perforations *a* and *b*, all arranged
face to face and combined to form a cartridge,

substantially as and for the purposes set
forth.

GEORGE QUICK.

Witnesses:

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