

(No Model.)

D. JOHNSON & W. D. BORLAND.

CARTRIDGE.

No. 392,922.

Patented Nov. 13, 1888.

Fig. 1.

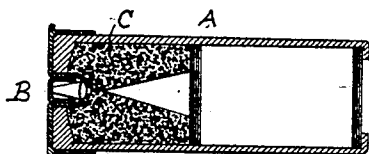


Fig. 2.

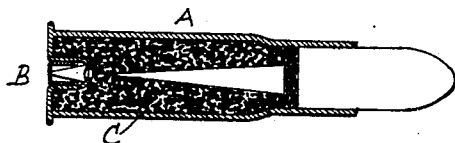


Fig. 3.

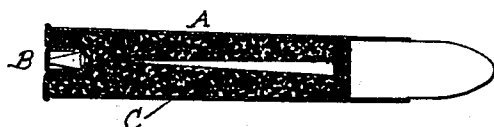
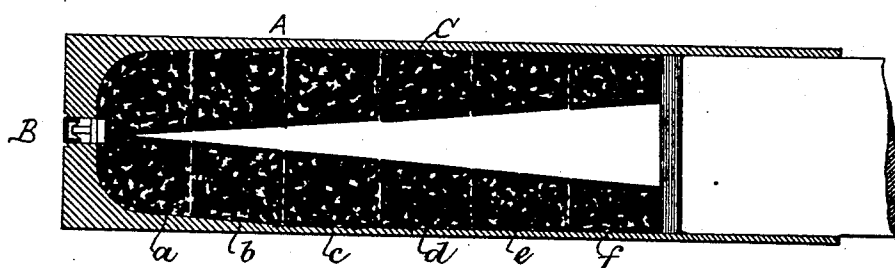


Fig. 4.



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UNITED STATES PATENT OFFICE.

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CARTRIDGE.

SPECIFICATION forming part of Letters Patent No. 392,922, dated November 13, 1888.

Application filed October 3, 1887. Serial No. 251,321. (No model.) Patented in England August 18, 1886, No. 10,580; in France September 19, 1887, No. 185,933; in Belgium September 19, 1887, No. 78,923; in Norway September 22, 1887, No. 660; in Italy September 30, 1887, No. 22,308; in Austria-Hungary March 2, 1888, No. 38,553, and in Spain April 23, 1888, No. 7,427.

To all whom it may concern:

Be it known that we, DAVID JOHNSON, residing at 52 Fitzjohn's Avenue, South Hampstead, London, England, gentleman, and WILLIAM DALRYMPLE BORLAND, residing at 35 Petherton Road, Highbury, New Park, London, England, chemist, subjects of the Queen of Great Britain, have invented certain new and useful Improvements in Cartridges, (for which we have received Letters Patent in Great Britain, No. 10,580, dated August 18, 1886; in France, No. 185,933, dated September 19, 1887; in Belgium, No. 78,923, dated September 19, 1887; in Austria-Hungary, No. 38,553, dated March 2, 1888; in Italy, No. 22,308, dated September 30, 1887; in Norway, No. 660, dated September 22, 1887, and in Spain, No. 7,427, dated April 23, 1888,) of which the following is a specification.

The object of this invention is to effect improvements in cartridges for military and sporting rifles, guns, and ordnance generally, for use with all kinds of powder.

The adoption of this invention is serviceable with cartridge-cases of a bottle-necked shape, such as are used with the regulation Martini-Henry and Martini-Enfield rifles. It also allows a cartridge-case to be used of a cylindrical or slightly-tapered shape with practically the same bore throughout as the bore of the gun. The length of the cartridge-case may also be materially shortened.

In charging the cartridge-cases we press the powder used into the case by a rammer having a shoulder and a tapering pointed end. The powder is pressed practically into a solid mass with a centrally-situated conical or cylindrical cavity nearly but not quite through the charge. The size and depth of this cavity are regulated by the nature of the powder used and the purpose for which the charge is to be employed. Cylindrical cartridge-cases may also be charged by introducing a separate cylinder of powder, prepared beforehand by pressure in suitable molds, and having a cavity similar to that described above.

The solid end of the cylindrical charge is to be placed against the flash end of the case, the

open end of the powder-cylinder being thus adjacent to the bullet. The sides of the conical or cylindrical cavities may be varnished with any material that will increase the coherence, or, if requisite, render the charge water-proof; or a conical or cylindrical tube of paper or other such material, plain or varnished, may be inserted in the cavity.

For heavy guns the charge may be made of several compressed blocks, which, when built up into a complete charge, may have one or more of such cavities, as have hereinbefore been described, extending from the ball end of the charge not quite through to the flash end.

The drawings annexed show examples of cartridges formed according to our invention.

Figure 1 is a longitudinal section of a cartridge for a sporting-gun. Fig. 2 is a longitudinal section of a bottle-necked military cartridge. Fig. 3 is a similar view of a cylindrical or but slightly-tapering military cartridge, and Fig. 4 is a similar view of a military cartridge of larger size for a quick-firing gun.

In the drawings, A indicates the case, B the central primer, and C the powder-charge. The powder-charge C has a tapering central hole, D, diminishing in size from front to rear and terminating just before the primer is reached, so as to leave a part of the charge in front of the primer, whereby safety in loading and certainty in firing are obtained. As before stated, also, the charges of powder or explosive might be separately compressed in molds and be afterward inserted into the cartridge-cases. We, however, prefer to compress them into the cases themselves, both for simplicity and cheapness, and also because the compressed charge then fits closely against the interior of the case and is not liable to be broken up when centrally ignited; also, as before stated, each charge may be composed of powder of different rates of combustion compressed into separate sections. At Fig. 4 it is shown to be formed in five sections, marked *a b c d e f*. Section *a* would first be compressed, then the powder for forming section *b* would be filled in on the top of it, and *b* would be compressed, and so on. Any suitable means may be adopted

for preventing the central hole formed in the sections first compressed from being filled in with powder used for forming the succeeding sections, or the powders of varying rates of combustion may be filled into the cartridge-case in the order *a b c d e f*, and then pressed up.

If a charge of powder be compressed, as hereinbefore described, with a pressure approximating to or greater than the pressure to which it will be subjected when ignited in the bore of a gun, the charge will not be broken up when ignited, but will be burned in place. The powder first ignited will be the small quantity just in front of the primer, and it will not be necessary to employ a powerful primer to effect the ignition of this portion of the charge with certainty. The gases from this will find a free vent through the central tapering cavity to the rear of the projectile, so that the gases will exert their pressure directly upon the base of the projectile, and not, as is usual, upon an unconsumed portion of the charge which intervenes between the projectile and the first ignited portion.

Preferably we form the chamber in which the cap is contained with a central flash-hole at its front end, so that when the cap is ignited the flash may pass directly to and ignite, first, the small quantity of powder, which is immediately in front of it, so that the ignition of this small quantity of powder may insure the ignition of the remainder of the charge. This small quantity of solid powder, which is retained unperforated just in front of the cap-chamber, also enables us with safety to compress the powder into the cases after the cap has been placed in the cap-chamber, as the point of the plunger is not brought into contact with the cap-chamber, and the cap-chamber is of amply sufficient strength to sustain the uniform compression which comes upon it by the compression of the powder.

We would state that we are aware that it has before been proposed to compress powder and explosive compounds into solid charges within the rear ends of cartridge-cases, and also to compress blocks of explosive com-

pounds separately in molds to be afterward inserted into cartridge-cases. It has also been proposed to form such solid blocks with a central hole of uniform diameter extending through them from end to end; and it has also been proposed to form such blocks with a central tapering hole extending through a portion of the charge quite up to the cap-chamber, so that the flash from the primer passes directly and without impediment into the cavity in the charge. It has also been proposed to form such blocks with a tapering hole extending into them from the front end; but in this case the ignition of the charge was effected at the front end of the block, and not at the rear end, as in our cartridges.

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

1. The cartridge hereinbefore set forth, consisting of the combination of the case, the central primer in its base, the charge compressed into the rear end of the case, and having a tapering central hole in the charge diminishing in size from front to rear and terminating just before the primer is reached, so as to leave a part of the charge in front of the primer, whereby safety in loading and certainty in firing are attained, as set forth.

2. The combination, as herein set forth, of the cartridge-case, the central primer in its base, the charge composed of blocks, rings, or sections having different rates of combustion, compressed into the rear end of the case, said charge having a tapering central hole diminishing in size from front to rear and terminating just before the primer is reached, so as to leave a portion of the charge in front of the primer to be ignited thereby before the flash enters the cavity in the charge.

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