J. W. OFFUTT.

CARTRIDGE CASE.

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1,187,464. Patented June 13, 1916.

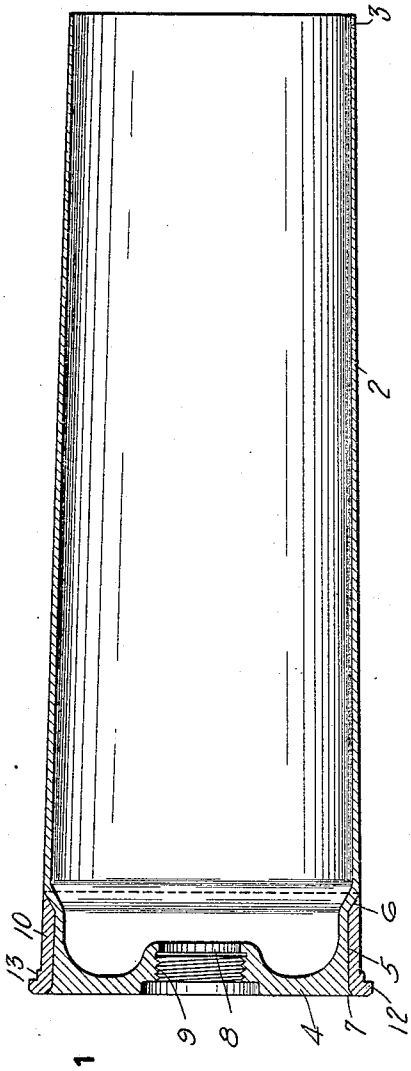


FIG. 1

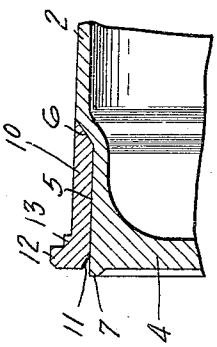


FIG. 4

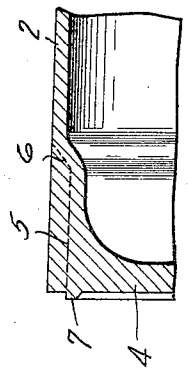


FIG. 3

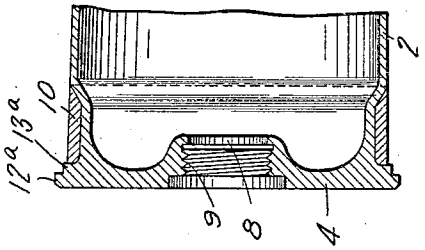


FIG. 5

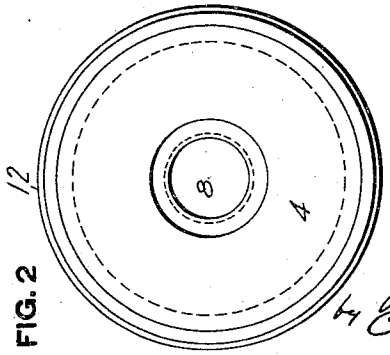


FIG. 2

WITNESSES

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CARTRIDGE-CASE.

1,187,464. Specification of Letters Patent. Patented June 13, 1916.

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To all whom it may concern:

Be it known that I, JOHN W. OFFUTT, a citizen of the United States, residing at Ellwood City, in the county of Lawrence and State of Pennsylvania, have invented certain new and useful Improvements in Cartridge-Cases, of which the following is a specification.

My invention relates to the construction of cartridge cases and more particularly of cartridge cases for guns of large caliber. Such cartridge cases usually are made of brass, of a composition which will provide the high elastic properties that are obtained by cold working, and it has been found practically impossible to obtain materials of the quality required to make a brass having the physical qualities necessary to stand the severe service conditions imposed on the cases with the powders now being used. Actual use of the cartridge cases shows it to be difficult, if not impossible, to construct a cartridge case which will not expand within the gun chamber when the cartridge is fired, particularly at the base of the cartridge case which is not fully confined or supported on account of the extractor mechanism of the gun and on account of the clearance necessary to enable the extractor mechanism of the gun to grasp and withdraw the exploded cartridge cases from the breech of the gun. With cartridge cases for guns of large caliber, wherein re-loading of the cases is usual and required, it has been found necessary to re-form or rectify the cases before they can be re-loaded, principally on account of the tendency of the cases when fired or exploded to swell or expand to such an extent as not only to become difficult to extract but also to expand the cases permanently to such an extent that the cartridge cases do not properly fit the gun after being re-loaded.

The primary object of my invention is to provide a cartridge case having novel means whereby expansion of the cartridge case at its base when the cartridge is fired or exploded is prevented and overcome.

Another object of my invention is to provide a cartridge case having an integral end closure formed of a suitable metal and having a reinforcing band or ring surrounding the base of the cartridge case, which is formed of a metal of materially greater tensile strength than that of which the cartridge case is composed.

A further object of the invention is the provision of a metallic cartridge case, which can be re-loaded without the necessity of re-forming or rectifying the cartridge case after each firing operation.

Still further objects of my invention will become apparent as the invention is more fully described hereinafter.

Referring now to the drawings forming part of this specification, Figure 1 is a sectional plan showing a cartridge case constructed and arranged in accordance with my invention. Fig. 2 is an end elevation of the closed rear end or base of the cartridge case shown in Fig. 1. Fig. 3 is a detail sectional plan showing the manner of drawing or forging the base of the cartridge case preparatory to machining the case for the attachment of the reinforcing band or ring applied to the base thereof in making cartridge cases in accordance with my invention. Fig. 4 is a similar detail sectional plan showing the preferred way in which the reinforcing ring is secured on the base of the cartridge case in accordance with my invention. Fig. 5 is a sectional plan of the rear end or base of a cartridge case showing a modification in the construction of cartridge cases made in accordance with this invention.

In the accompanying drawings the numeral 2 designates the wall of the cartridge case which tapers from the rear end or base toward the projectile end 3 of the cartridge case. As shown the wall 2 also tapers in thickness from the base end toward the projectile end 3.

The cartridge case preferably is formed of brass of suitable composition which will have the desired physical properties under the cold drawing or forging operations to which the metal is subjected in forming the cartridge case.

The cartridge case is provided with a thickened rear end or closure 4 which is formed integral with the wall 2 and which when the drawing operations are completed is shaped as shown in Fig. 3. The cartridge case of Fig. 3 is then machined or turned on its outer surface to the required diameter and taper, and the base end of the cartridge case is turned off and the metal removed to form a reduced portion 5 and inclined shoulder 6 with an annular projection 7 on the extreme end of the cartridge case. An axially central opening 8 is then bored and

counterbored and provided with the screw threads 9 by which a removable primer (not shown) is detachably secured in the cartridge case. An annular steel ring 10 having a high tensile strength and high elastic limit, is then machined and bored the inner diameter of this ring being made small enough to require considerable pressure to the ring upon reduced portion 5 of the base of the cartridge case or with a force sufficient to put the ring 9 under tension when in place on the cartridge case.

The corner 11 of the opening in the annular ring 10 is beveled or flared outwardly at one end and is provided with flanges or shoulders 12 and 13 on its outer surface which are engaged by the extractor mechanism of the gun in removing the cartridge cases from the gun after the firing operations.

The base of the cartridge case has an integrally formed annular projection 7 which is formed thereon in the machining operations and after the ring 10 is positioned on the reduced portion 5 the projection 7 is peened or spun outwardly and expanded into tight holding engagement with the flaring surface 11 of the ring 10 to securely fasten this ring in place and prevent its being withdrawn from the end of the cartridge case when gripped by the gun extractor mechanism in removing the cartridge case from the gun. After the reinforcing ring 10 has been secured on the cartridge case, the outer surfaces of the cartridge case and ring are turned to the finished diameters and taper, although in some cases this finishing operation may be dispensed with.

In the modified construction shown in Fig. 5. the flanges are omitted from the steel reinforcing ring 10 and the projection 7 on the end closure or base of the cartridge case is made of sufficient size to permit of its being peened or spun outwardly into holding engagement with the edge of the ring 10 and provide the metal necessary to form on the base the flanges 12^a, 13^a by which the cartridge case of Fig. 5 is engaged by the extractor mechanism.

The advantages of my invention will be apparent to those skilled in the art. The provision of the steel reinforcing ring at the base of the cartridge case materially increases the strength of the cartridge case and the expansion of the case when the cartridge is fired is avoided and overcome, with little or no added cost while the necessity of reforming or rectifying the cartridge cases after each firing operation as has heretofore been necessary is avoided and overcome.

By making metallic cartridge cases in accordance with my invention a steel banded metal cartridge case is provided which may be machined as readily and as cheaply as a solid brass case. The cartridge cases will stand repeated firing without the necessity of reforming or rectifying while the difficulty of upsetting the brass in forming a head having integral flanges for engaging the extractor mechanism is avoided. As the weak point of the cartridge cases is heavily reinforced, a cheaper grade of brass may be used, while a cartridge case is provided which will not expand permanently and will not stick or injure the breech of the guns in the firing operations.

Modifications in the construction and arrangement of the parts may be made. When found desirable or necessary the inner surface of the annular reinforcing ring may be grooved or roughened and the base of the cartridge case expanded into the so-formed recesses in the inner surface of the reinforcing ring in securing or assisting in securing the reinforcing ring in place on the cartridge case and other changes may be made within the scope of my invention as defined in the appended claims.

I claim:—

1. A cartridge case comprising a tubular metal wall having an integral end closure at the base thereof and an annular reinforcing ring of a dissimilar metal and greater tensile strength surrounding the wall at the base of the cartridge case and fastened in place thereon, said reinforcing ring being put in tension in being secured on the cartridge case, and an integral projection on the end of the cartridge case expanded into holding engagement with the edge of said reinforcing ring.

2. A metal cartridge comprising a tubular wall having an integral end closure at the base thereof, said base being reduced in diameter adjacent to the closed end thereof, a reinforcing ring of a dissimilar metal and greater tensile strength on said reduced portion of the wall, said reinforcing ring having a beveled inner edge, and an integral projection on the end of the cartridge case expanded into engagement with the beveled edge of said annular ring to secure said ring on the case.

3. A metal cartridge comprising a tubular wall having an integral end closure at the base thereof, said base being reduced in diameter adjacent to the closed end thereof, a reinforcing ring of a dissimilar metal and greater tensile strength on said reduced portion of the wall, and an integral projection on the end of the cartridge case expanded into holding engagement with the edge of said reinforcing ring.

4. A metal cartridge comprising a tubular wall having an integral end closure at the base thereof, said base being reduced in diameter, an annular reinforcing ring of greater tensile strength on said reduced

portion of the wall, and a projection on the base of the cartridge case expanded into holding engagement with the edge of said reinforcing ring.

5. A metal cartridge comprising a tubular wall having an integral end closure at the base thereof, said base being reduced in diameter, an annular reinforcing ring of greater tensile strength on said reduced portion of the wall, said reinforcing ring having a beveled inner edge, and a projection on the base of the cartridge case expanded into engagement with the beveled edge of said ring to secure said ring on the case.

In testimony whereof I have hereunto set my hand.

JOHN W. OFFUTT.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."