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J. A. DICKERMAN

1,853,262

PRIMER CUP

Filed March 26, 1930

Fig. 1.

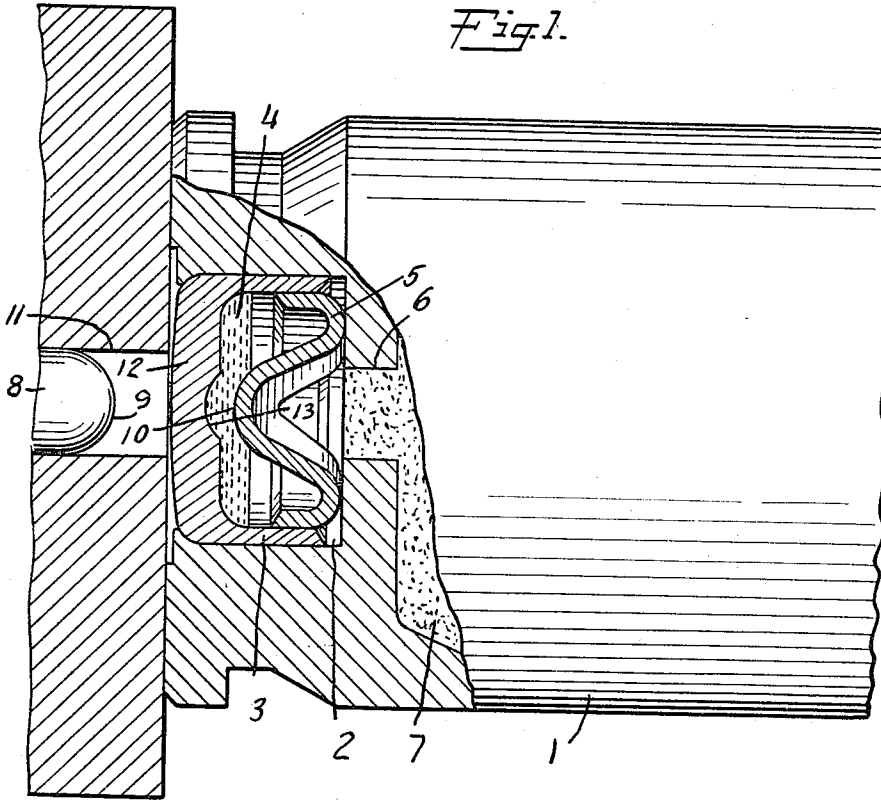


Fig. 2.

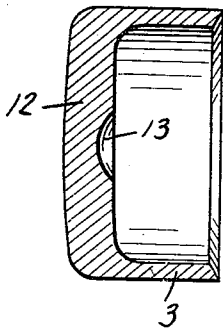
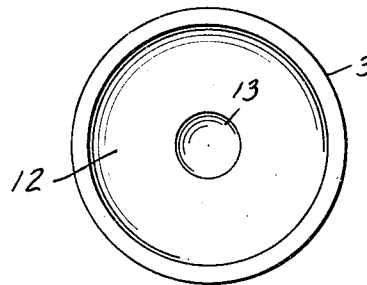


Fig. 3.



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PRIMER CUP

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This invention relates to primers for ammunition and more particularly to primer cups.

In the construction of primer cups certain definite requirements must be met. In the first place the metal of the cup must be able to resist the pressure developed when the priming mixture burns or primer leaks pierced primers and other irregularities will result. At the same time, the thickness of the primer cup must be kept within certain limits or the primer will be lacking in sensitivity.

In the use of the old and well known potassium chlorate mixtures consisting of potassium chlorate, mercury fulminate and a fuel, such as lead sulphocyanate, or antimony sulphide, a primer cup is used with certain calibre cartridges in which the thickness of the bottom of the cup is .025 inches. In the use of non-corrosive priming mixtures in which barium nitrate, or some other oxidizing agent having a non-corrosive residue, is substituted for potassium chlorate, the mercury fulminate content of the mixture is usually increased to obtain the same degree of sensitivity and the same priming capacity as that of the corresponding potassium chlorate mixture for which it is to be substituted. The use of these non-corrosive mixtures has presented new problems in ammunition manufacture. The larger volume resulting from the use of these mixtures decreases the available gas space in the primer cup with the result that higher pressures are created in the more restricted space and in some instances the bottom of the primer cup is pierced causing gas leakage in and around the bolt of the gun. A stiffer or thicker metal is therefore necessary to withstand these pressures and it has been proposed to increase the thickness of the bottom of the cup from .025 inches to .035 inches. However, a priming cup of the ordinary construction of .035 inches produces a primer that is lacking in sensitivity.

I have found that the desired sensitivity can be obtained by forming an indentation in the bottom of the cup substantially in alignment with the anvil of the primer and the point struck by the firing pin leaving the

rest of the bottom of the priming cup of its original thickness. The indenting operation hardens the soft cup metal which makes it more resistant to shearing stresses and as the metal is of the increased thickness at the point where it contacts with the edges of the firing pin hole the tendency to shear is overcome without decreasing the sensitivity of the primer.

In the accompanying drawings I have shown one form of the invention. In this showing,

Fig. 1 is an elevation of a cartridge case showing the primer in position and also showing the position of the firing pin when the cartridge is in the gun;

Fig. 2 is a sectional view of the primer cup removed; and,

Fig. 3 is a plan view thereof.

Referring to the drawings, the reference numeral 1 designates a cartridge case of the usual construction. If the cartridge is intended for use in center fire cartridges, it is provided with a recess 2 in the bottom adapted to receive primer cup 3. The primer cup is of varying size for different cartridges, but for a given calibre of cartridge the cup is of uniform size within certain specified limits and is seated in the bottom of the cartridge to a uniform depth. The priming mixture which initiates the explosion of the cartridge is placed in the primer cup as indicated at 4 and an anvil 5 is seated in the cup before it is placed in the cartridge. The bottom of the recess 2 is provided with one or more flash holes 6 through which the flame created by the burning of the primer is adapted to pass to ignite the propellant powder 7. The firing pin of the gun is shown at 8 in Fig. 1 of the drawings and is provided with a rounded head 9 which is adapted to strike the bottom of the primer cup substantially centrally thereof and at a point in alignment with the crown 10 of the anvil. The firing pin is arranged in a firing pin opening 11 which is necessarily of the diameter of the body portion of the firing pin so that when the pin is in its extreme forward position there is a space in the end of the firing pin opening due to the rounded

head of the pin. If the pressure produced by the burning of the priming mixture is too great, it tends to shear off a portion of the bottom of the primer cup of the diameter of the firing pin opening and permit gases to escape around the bolt.

As stated, it has been found necessary to increase the thickness of the bottom of the cup to prevent this shearing action and in order to provide a priming cup of this increased thickness without decreasing the sensitivity of the assembled primer I provide a spherical indentation in the center of the bottom of the cup. It will be noted from Fig. 1 of the drawings that while this indentation retains the desired thickness of metal between the head of the firing pin and the anvil, the portion of the metal that is submitted to the shearing strain adjacent the ends of the firing pin opening is of the desired increased thickness and that the tendency of a disc of metal to shear from the bottom of the priming cup is therefore overcome. The dimensions given for the thickness of the bottom of the priming cup and the thickness of the indented portion are, of course, merely illustrative. The bottom wall of the primer cup may be made of any necessary increased thickness to prevent shearing with the central portion indented in the manner described above to produce the desired thickness at the point struck by the firing pin and thus retain the sensitivity of the assembled primer.

I claim:

1. A cartridge comprising a cartridge shell having a recess in the bottom thereof, a primer cup mounted in said recess, said primer cup having a central depression of limited area of decreased thickness, and an anvil mounted in said cup and positioned above and outside of said depression.

2. A cartridge comprising a cartridge shell having a recess in the bottom thereof, a primer cup mounted in said recess, said primer cup having a central depression of limited area of decreased thickness, a charge of priming mixture in said cup substantially covering the bottom of said primer cup, and an anvil mounted in said cup and positioned above and outside of said depression.

In testimony whereof I affix my signature.

JOHN A. DICKERMAN.

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