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L. MEISTER

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SEALING FLASH HOLES OF PRIMERS

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Fig. 1 -

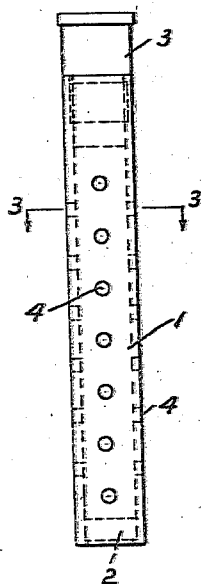


Fig. 2 -

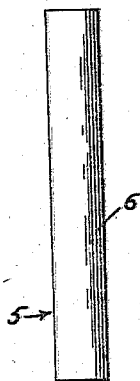


Fig. 3 -

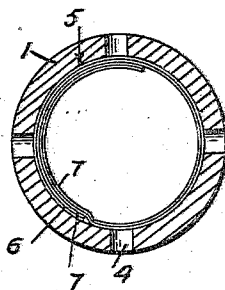
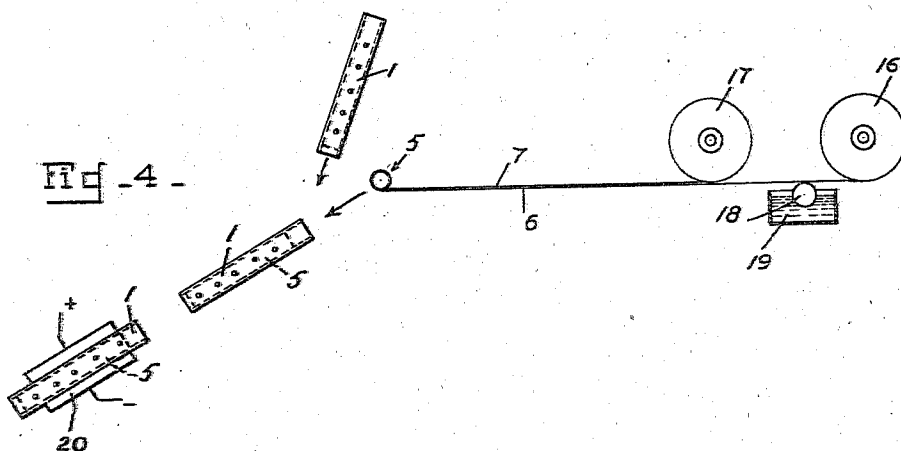


Fig. 4 -



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SEALING FLASH HOLES OF PRIMERS

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4 Claims. (Cl. 102—86.5)

(Granted under the act of March 3, 1883, as amended April 30, 1928; 370 O. G. 757)

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The invention described herein may be manufactured and used by or for the Government for governmental purposes, without the payment to me of any royalty thereon.

This invention relates to improvements in the sealing of the flash holes of primers used in artillery shells. Artillery ammunition primers are generally long metal tubes, preferably made of brass, which are closed at both ends and have a number of small vents or flame holes uniformly spaced throughout their surface. The primer is filled with a suitable ignition charge, usually black powder, and the cap which closes one of the ends of the tube carries a suitable percussion element for igniting the ignition charge within the tube.

The flame holes of the primer must be sealed before insertion of the ignition charge, not only to prevent leakage of the powder, but to form an effective seal against the harmful effects of gases and moisture, and must remain sealed until after the shell is fired. The burning of the ignition charge produces flame which destroys and clears away the sealing material in passing through the flame holes to the exterior of the primer tube.

In the presently used method of sealing these flame holes a paper tube is inserted into the primer tube as a lining and the primer tube is immersed in a bath composed of a compound tar filler. The primer tube is then placed in a heating oven for about twelve hours, whereupon it is removed and the excess tar is wiped off the surface of the primer. By this process the flame holes are sealed by the paper lining and the filler compound which is baked into the holes.

An important object of this invention is to speed up the sealing operation, and especially to eliminate the need of baking the filler compound over a long period of time.

Another important object of the invention is to provide a more economical method of sealing the flame holes, and one which will more effectively seal the said flame holes against the entry of gases and moisture.

For the attainment of these and such other objects of invention as may appear or be pointed out herein, I have shown one embodiment of my invention in the accompanying drawings, forming part of this specification, wherein similar numbers are used to designate like parts throughout the same.

In the drawings:

Figure 1 is an elevation of an artillery ammunition primer provided with the improved flame hole seal of this invention,

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Figure 2 is an elevation of a lining tube of this invention,

Figure 3 is a transverse section of an artillery primer provided with the improved flame hole seal, taken on the line 3—3 of Figure 1, and

Figure 4 is a schematic flow-diagram of the process of this invention.

The artillery ammunition primer shown in Figure 1 comprises a metal primer tube 1, hereinafter referred to in the specification and in the appended claims as the "primer," closed at one end by a tightly fitting plug 2 and at the other end by a cap 3 which is screwed in tight engagement with the primer 1 by means of screw threads (not shown) which are provided in said primer. The cap 3 is arranged to carry a suitable percussion element for igniting the igniter charge. The primer 1 is provided with a number of vents or flame holes 4 for the passage of flame arising from the burning igniter charge when shell is fired.

My improved method of sealing the flame holes contemplates the employment of the presently used paper liner or lining for the primer, in combination with a strip of tin-foil or other thin-walled metallic substance readily fusible by the flame produced by the burning of the igniter charge. The said metallic substance and paper are combined in such manner that they will form a composite metallic-paper lining with the metallic substance on the outside so that it abuts against the inside surface of the primer when the composite lining is inserted therein.

The composite lining, designated generally by the numeral 5, is shown in Figure 2. The numeral 6 designates the tin-foil or metallic outer surface. The lining 5 is made by winding strips of the metallic substance and paper together to form the said tube 5, with the metallic substance on the outside. The outside diameter of the lining tube 5 should be slightly smaller than the inside diameter of primer 1 so that it may be easily inserted and fit closely therein, covering all of the flame holes 4 thereof. The length of the strips forming the lining tube 5 should be such as to provide an overlap in winding of about one-half of the circumference, as shown in Figure 3. The paper used should be of sufficient stiffness to support the metallic substance, to prevent any collapsing or sagging of the said tube 5 due to the predominant weight of the metal.

The lining tube 5 is formed as illustrated in Figure 4, wherein a roll of paper 17 and a roll of the metallic substance 16 are shown being un-

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reeled in the same horizontal plane, one upon the other. A strip of appropriate length is cut from this composite layer and wound into a tube 5 to form the lining of the primer 1. The tube 5 is then inserted into the said primer, and the whole is subjected to a heat sufficient to melt the metallic substance and cause it to adhere to the inner wall of the said primer tube between and below the flame holes 4. The heating may be accomplished by means of a high-frequency induction furnace 20, as shown in Figure 4, or by any other suitable heating method. To assure adherence, the outer surface of the metallic substance is coated with a soldering flux, as by passing it over a roller 18 of a trough 19 containing flux while it is being unreeled, as is shown in Figure 4.

It should be pointed out that the method presently used for forming the paper lining tube and inserting it in the primer differs from the improved process only by the addition of the reel of metallic substance, the container for the flux, and in the passing of the primers through the furnace after the tube has been inserted. For this reason, much of the equipment, tools and apparatus now used may be used in the improved process. It should also be pointed out that if tin and tin-bearing solder is used in forming these tubes, there is an additional advantage in that the tin serves as a decoppering agent in preventing coppering of the gun barrel during fire.

I claim:

1. An artillery primer comprising a perforated primer tube, a lining composed of a paper strip and a readily fusible metallic strip wound into a tube with the metallic strip on the outside and inserted within the said primer, the said metallic outside surface of the lining being soldered to the inside surface of the primer.

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2. An artillery primer comprising a perforated primer tube, a readily fusible metallic strip wound into a tube and inserted within the said primer and the said metallic strip being soldered to the inside surface thereof.

3. A primer comprising an igniter charge tube closed at one end and having flame openings in its walls, and a thin-walled metallic tube inserted therein and soldered to the walls thereof between the said flame openings.

4. A primer comprising an igniter charge tube closed at one end and having flame openings in its walls, and a composite tube formed by winding together a strip of paper and a thin-walled metallic strip, the said metallic strip being on the outside, inserted within the charger tube, the said metallic strip being soldered to the inside surface of the said charge tube between the flame openings.

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