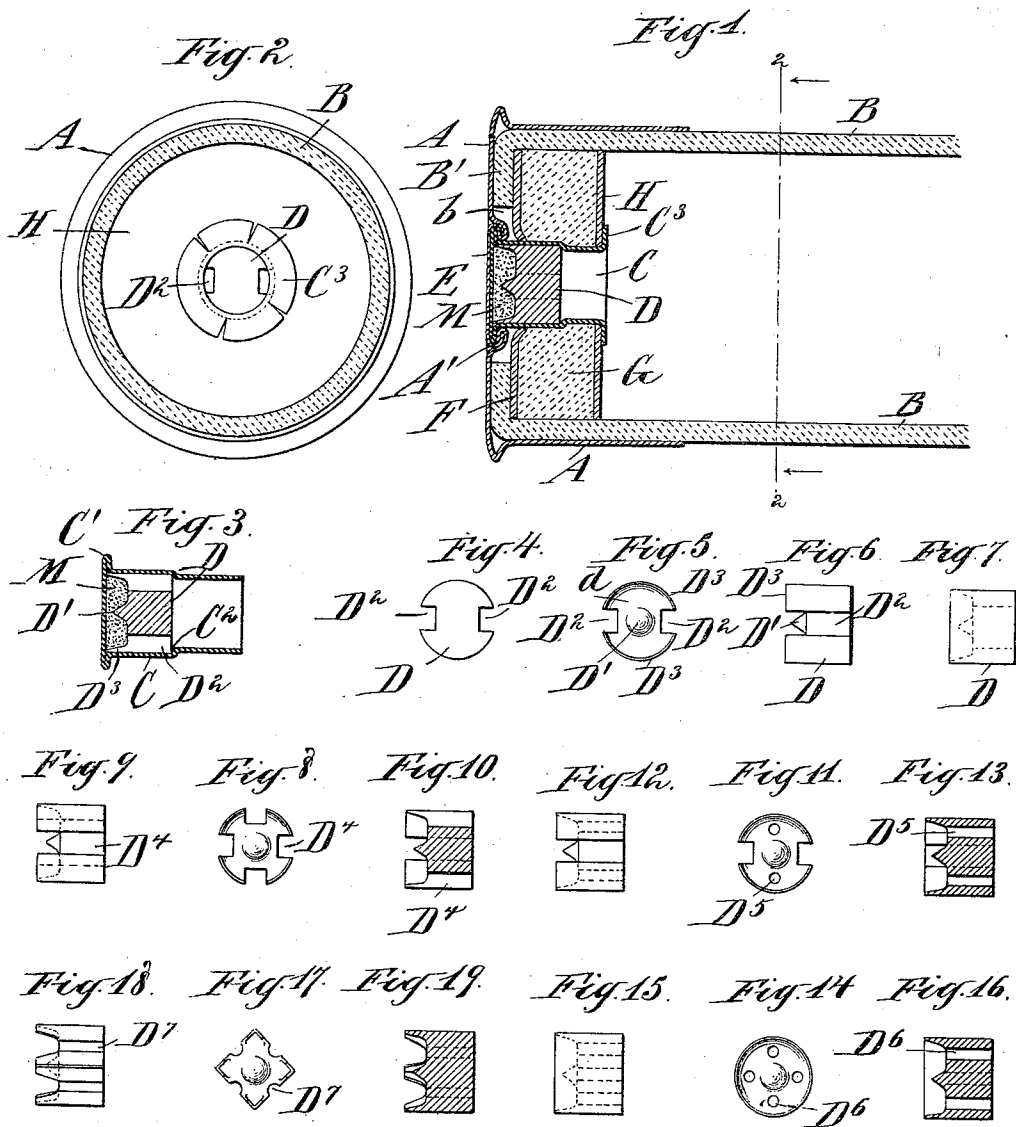


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CARTRIDGE.
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UNITED STATES PATENT OFFICE.

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CARTRIDGE.

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To all whom it may concern:

Be it known that I, GOTTLOB E. LOEBLE, a citizen of the United States, residing in the city of New York, borough of Brooklyn, in the county and State of New York, have invented a certain new and useful Improvement in Cartridges, of which the following is a specification.

The invention relates to the construction of fixed ammunition and more particularly to the primer by which the cartridge is fired.

The object of the invention is to provide primers in which the charges of fulminate are accurately measured and uniform, and in which the fulminate is reliably held against displacement in assembling the shells and in transporting the latter, not liable to accidental discharge in the assembling and loading operations, and so disposed and presented in the base of the shells as to insure certainty of fire under the action of the firing-pin.

Another important object is the complete sealing of the cartridge base, thereby insuring against accident through the rearward escape of gases, and in provisions for permitting the anvil-cup or primer to expand at the instant of explosion and thus lessen the danger of bursting the primer and opening the base of the cartridge shell by the discharge of the fulminate.

The invention consists in certain novel features and details of construction and arrangement by which the above objects are attained, to be hereinafter described.

The accompanying drawings form a part of this specification and show approved forms of the invention.

Figure 1 is an axial section through the base of a shell constructed in accordance with the invention and adapted for service in a shot-gun. Fig. 2 is a transverse section taken on the line 2—2 in Fig. 1. Fig. 3 is an axial section through the anvil-cup and anvil. Fig. 4 is a rear view of the anvil alone. Fig. 5 is a front view, and Fig. 6 is a side view. Fig. 7 is a side view at a right angle to the preceding figure. The succeeding figures show modified forms of the anvil. Fig. 8 is a front view of an anvil provided with four fire-channels instead of the two shown in the preceding figures. Fig. 9 is a corresponding side view, and Fig. 10 an axial section. Fig. 11 is a front view of an

anvil having two fire-channels and two additional firing perforations. Fig. 12 is a corresponding side view, and Fig. 13 an axial section. Fig. 14 is a front view of an anvil in which the fire-channels are omitted but having four firing perforations. Fig. 15 is a corresponding side view, and Fig. 16 an axial section. Fig. 17 is a front view of still another form of anvil having a square cross-section, the exterior spaces thus provided serving as fire channels. Fig. 18 is a corresponding side view, and Fig. 19 an axial section.

Similar letters of reference indicate like parts in all the figures.

The invention is shown as applied to a shot shell, and referring to Figs. 1 to 7 inclusive, A is the metallic base of the shell, B the paper tube matching thereto and bent inwardly at the rear end to lie against the inner face of the base and form an annular flange B¹ around a central opening b. C is the anvil-cup and D the anvil therein which with the fulminate M forms the primer, having a flange C¹ at the rear. The cup may be inserted and held in the cartridge in various ways; in the preferred form shown it is engaged in the base A of the shell by a cap E covering the rear face of the primer and its flange and interlocked as at A¹ with the metal of the base as shown. The anvil D has a short cylindrical body hollowed at the rear to form a cup-shaped cavity d having a central spur D¹ and provided with two longitudinally extending exterior grooves D² serving as fire-channels. The cavity d is filled with the fulminate M and struck off flush with the rim D³ surrounding the cavity, and the anvil thus loaded is placed in the anvil-cup with the fulminate against the inner face of its base and is held in position by reducing or crimping the metal of the cup forward of the anvil to form the retaining shoulder C². After the anvil-cup and its cap E are locked to the base of the shell, an annular disk F is forced down upon the flange B¹ of the paper tube, and is followed by a base-wad G faced with a metal washer H. When thus assembled the protruding end of the anvil-cup is spread and flattened as at C³ to engage the washer and lock all the parts firmly in place. The fulminate is exploded by the action of a firing-pin or hammer against the cap E; the impact indents the cap and base of the cup

and the resultant friction of the fulminate with the spur D¹ and notched edges of the rim D³ ignites the fulminate and through the channels D² fires the charge in the shell.

5 It will be observed that the rear of the shell is sealed and no escape of gases in this direction permitted. To provide space for expansion of the anvil-cup at the instant of explosion the annular space or recess *b* is
10 utilized; this recess is sufficient to permit the slight expansion required and thus relieve the base A and cap E from strains due to explosion of the fulminate and lessen the danger of fracture or rearward leakage.
15 This provision is of special importance in the use of new smokeless powders requiring an increased charge of fulminate. As the cavities *d* in the anvils are of uniform size and each filled level full, the surplus being
20 struck off, each contains the same measured quantity of fulminate, the cavity itself serving as the measure, and by reason of the cup shape of the cavity the fulminate, which is applied in a pasty condition and subsequently dried, adheres closely therein. The
25 anvil thus constructed is placed in the anvil-cup without disturbing the fulminate, and as the latter is protected by the rim D³ extending slightly beyond the spur D¹, the
30 operation of loading the anvil-cups is attended with but little danger of loss or damage by accidental explosions, and the primer is inserted in the shell in the act of
35 assembling without danger of accident. The fulminate being confined in the cavity in close contact with the base of the primer cannot be disturbed or dislodged by jars or shocks to which the cartridge is subjected in
40 handling or transportation, thus insuring certainty of fire.

In the modification shown in Figs. 8, 9 and 10, four fire channels D⁴ are shown, and in Figs. 11, 12 and 13 two additional passages in the form of perforations D⁵ D⁶ are
45 provided extending through the anvil parallel with its axis, thus increasing the area of fire-transmission to the cartridge charge.

In Figs. 14, 15 and 16 an anvil with four similar perforations D⁶ D⁶ is shown, and the
50 peripheral channels are omitted.

In Figs. 17, 18 and 19 an anvil of square cross-section is illustrated, which when received in a cylindrical anvil-cup affords fire spaces between the plane faces of the anvil
55 and circular wall of the cup; such spaces are shown as augmented by longitudinal grooves D⁷ D⁷ on the plane faces.

In all the forms it is essential that the anvils be of sufficient diameter and length
60 to insure firm engagement and parallelism with the anvil-cups in which they are inclosed.

Other modifications may be made in the forms and proportions in adapting the
65 invention to various purposes to which it may

be applied. Although the invention is shown as serving in a shot shell it will be understood that it may be applied to other forms and types of cartridges.

I claim:—

1. In a primer, an anvil having in its end a cavity with a spur, said cavity adapted to receive and hold a charge of fulminate, such cavity being axially imperforate and serving as a measuring means for such
70 charge.

2. In a primer, an anvil having an axially imperforate cavity in its end, with a spur, said cavity adapted to receive and hold a charge of fulminate, and an anvil-cup in
80 which said anvil is secured with said cavity presented to the base of said cup.

3. In a cartridge, an anvil having an axially imperforate cavity in its end with a spur, said cavity adapted to receive and
85 hold a charge of fulminate, a covering for said cavity, and means for holding said anvil and covering in such cartridge.

4. In a primer, an anvil having an axially imperforate cavity in its end with a spur,
90 said cavity adapted to receive and hold a charge of fulminate, and an anvil-cup in which said anvil is received with said cavity presented to the base of said cup, said anvil constructed to provide fire spaces leading from said cavity to the opposite end of
95 said anvil.

5. In a primer, an anvil having a cavity in its end with a spur, said cavity adapted to receive and hold a charge of fulminate,
100 and an anvil-cup in which said anvil is received with said cavity presented to the base of said cup, said anvil having fire-channels in its outer surface.

6. In a primer, an anvil having an axially
105 imperforate cavity in its end adapted to receive and hold a charge of fulminate, and means in said cavity for inducing friction in said fulminate when the latter is compressed by an exploding means.

7. An anvil having an axially imperforate cavity in its end adapted to receive and hold a charge of fulminate, and a spur in
110 said cavity.

8. In a primer, an anvil having an axially
115 imperforate cavity in its end adapted to receive and hold a charge of fulminate, an anvil-cup in which said anvil is received and held with said cavity presented to the base of said cup, and a spur in said cavity.

9. In a primer, an anvil having a cavity in its end with a central elevation in said
120 cavity, said cavity adapted to receive and hold a charge of fulminate and surrounded by a rim, and having channels on the outer face of said anvil forming notches in said rim.

10. In a primer, an anvil having a cavity in its end adapted to receive and hold a
125 charge of fulminate and surrounded by a

rim, and having channels in the outer face of said anvil forming notches in said rim, and a spur in said cavity.

5 11. In a primer, an anvil having a cavity in its end with a central elevation in said cavity, said cavity adapted to receive and hold a charge of fulminate, a rim surrounding said cavity and having notches therein, said anvil having fire spaces leading from
10 said cavity.

12. In a cartridge, a base, a primer therein and an anvil in said primer, and a base-

wad inclosing said primer, said cartridge having an open annular space between said base and base-wad and surrounding said 15 primer.

In testimony that I claim the invention above set forth I affix my signature, in presence of two witnesses.

GOTTLOB E. LOEBLE.

Witnesses:

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CHARLES LEE MEYER.