May 19, 1936. E. LEUSSLER 2,041,253

CARTRIDGE SHELL

Filed May 13, 1935 2 Sheets-Sheet 1

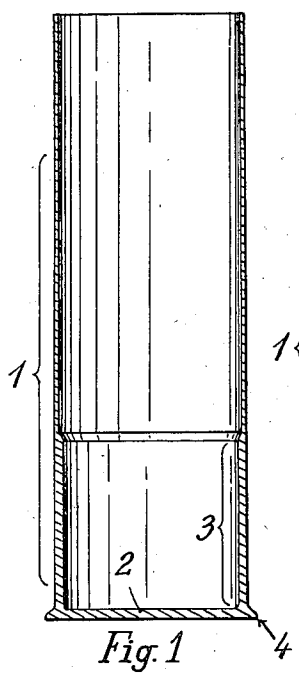


Fig. 1

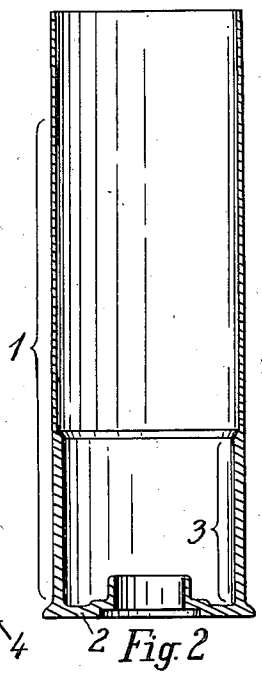


Fig. 2

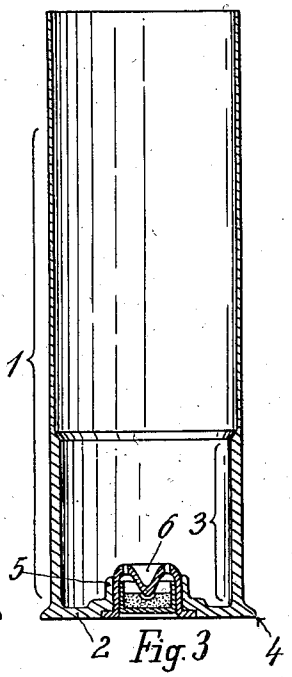


Fig. 3

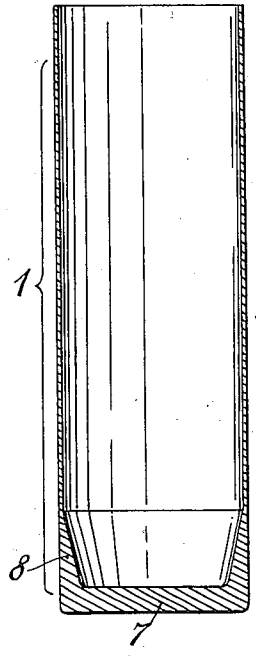


Fig. 4

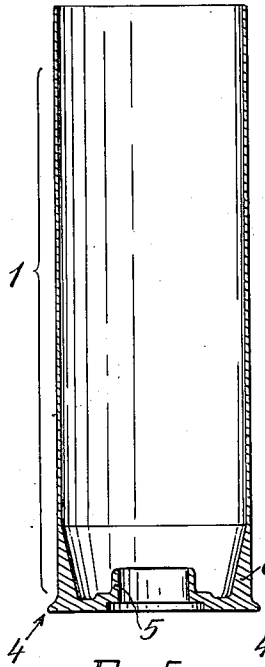


Fig. 5

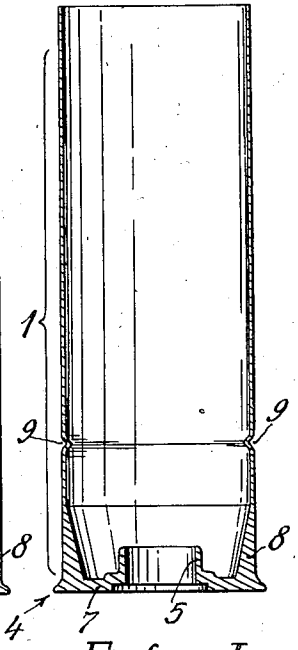


Fig. 6

Inventor:
Emil Leussler
By Arthur M. Hahn
Atty

May 19, 1936. E. LEUSSLER 2,041,253

CARTRIDGE SHELL

Filed May 13, 1935 2 Sheets-Sheet 2

Fig. 7

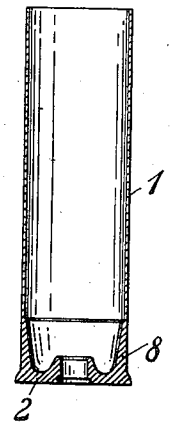


Fig. 8

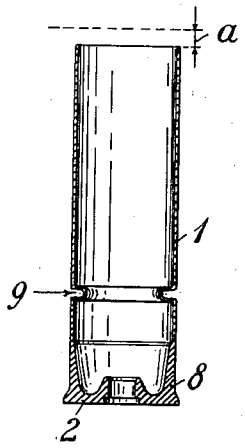


Fig. 9

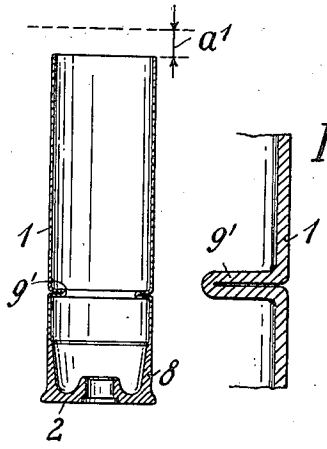


Fig. 10

Fig. 11

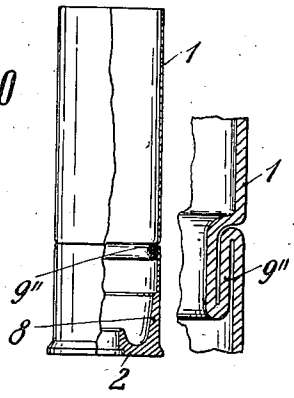


Fig. 12

Inventor:

Emil Leussler

By Arthur M. Hahn

ATTY.

Patented May 19, 1936 2,041,253

UNITED STATES PATENT OFFICE

2,041,253

CARTRIDGE SHELL

Emil Leussler, Nuremberg, Germany

Application May 13, 1935, Serial No. 21,255
In Germany March 15, 1934

3 Claims. (Cl. 102—13)

This invention relates to cartridge shells, especially for small shot cartridges preferably to be used in connection with shot-guns for hunting purposes. Heretofore the shells for cartridges of this kind have ordinarily been made from pasteboard and the bottom of the cartridge had been provided with a metal-cap inserted into or otherwise fastened to said bottom to serve as an opening for the reception of the percussion or priming cap.

Cartridges for small shot have also been made in the form of metal shells by pressure-casting that is from hot aluminum or zinc alloys or similar material. These metal shells have likewise been provided with caps at their bottom or made integral with the latter.

The aforementioned pasteboard as well as metal shells are further equipped with an inner aperture or bung-hole formed by a special short ring made of pasteboard or metal, said ring forming the boundary for the powder space of the cartridge and serving as a support for an intermediary disk of pasteboard, felt or the like, said disk separating the powder space from the remaining space of the cartridge which serves for the reception of the charge of small shot.

According to my invention the shell of the small shot cartridge is made integral with the bottom-part thereof which is provided with a seat or receptacle for a priming cap, as well as with the aforementioned reinforced wall extending over a proper portion of the length of the shell by means of a process of pressing from a piece of material in cold condition thereof. In this case said reinforced wall of the shell may immediately serve as a support for the aforementioned intermediary disk, or said support may also be represented by a groove-like contraction at the proper place on the shell whose reinforced bottom part may be provided with the aforementioned seat or receptacle for the priming cap by subsequently shaping said bottom part by means of a mechanical pressure process.

By my invention the manufacture of cartridges for small shot may be considerably simplified and the cost of manufacture greatly reduced and in addition, cartridge shells made according to my invention will be of extraordinary strength in spite of the small thickness of their walls.

According to my invention the aforementioned groove-like contraction which serves as a supporting collar for said intermediary disk may also be made in the form of a compressed fold obtained from an annular groove folded by pressure against the inner wall of the shell which results in the advantage that the shell cannot yield in longitudinal direction or be stretched or resiliently expanded upon firing as is the case with cartridges in which said supporting collar is constituted solely by an annular groove drawn into the interior surface of the tube.

In the accompanying drawings which form part of this specification I have shown several forms of construction of my new metal cartridge shell and the several steps of manufacturing the same. In the drawings, Figs. 1, 2, and 3 are vertical sectional views and show in a greatly enlarged scale a construction of my new cartridge shell in which the supporting collar for said intermediary disk is obtained by properly reinforcing the walls of the shell along the powder space. Figs. 4, 5 and 6 are similar representations of a contruction of my cartridge shell in which the support for said disk is constituted by a contraction of the shell at the forward end of the powder space, while Figs. 7, 8, 9, 10, 11 and 12 show on a smaller scale further constructions of my new cartridge shell in which the support for said intermediary disk is made in the form of a compressed fold obtained from an annular groove pressed into the surface of the shell, said groove being folded together by compression towards the interior surface of the shell. In these views, Figs. 7, 8 and 9 are vertical sectional views; Fig. 10 is an enlarged fragmentary view in vertical section of the fold illustrated in Fig. 9; Fig. 11 is a view partly in elevation and partly in vertical section of a shell having the completed fold; and Fig. 12 is an enlarged fragmentary view in vertical section of such completed fold.

All constructions of my new cartridge shell described herein and shown in the drawings are made in accordance with my invention as an integral piece by way of a process of cold pressing, and more particularly with a reinforced bottom part and a reinforced wall extending along the length of the powder space of the cartridge, said reinforced wall serving as a support for said intermediary disk.

According to my invention the metal from which the new cartridge shell is made is placed in cold condition and in the shape of a plate into a proper female die or mould and pressed into the latter by means of a male die under high mechanical pressure. By reason of the high pressure and the sudden development of heat ensuing therefrom the cold metal plate will became mouldable and

the liquid metal will now be pressed upward between the female die and the male die into the shape of a cartridge shell.

In order to manufacture cartridge shells according to Figs. 1, 2 and 3, there is at first made a shell f as shown in cross-section in Fig. 1 by a process of cold pressing. At its underside the shell body f extends into the bottom part 3 with its outer annular rim 4, both integral with said shell body, the wall of said bottom part being reinforced with respect to the wall of the shell body proper and extending to the full length of the powder space. The cartridge shell after having been given the form shown in Fig. 1 is now provided at its bottom surface with a central seat 5 as shown in cross-section in Fig. 2, said seat 5 serving as a receptacle for the priming cap as shown in Fig. 3 likewise in cross-section. The powder is now filled in the usual manner into the so completed cartridge shell, covered up by means of an intermediate disk which is supported by the upper rim of the reinforced wall portion 3 of the shell, and now the charge of small shot is filled-in and covered up by another disk, which is kept in position in the usual way by inward bending or crimping of the free upper margin of the shell.

In the construction of the cartridge shell shown in Figs. 4, 5 and 6 there is at first again made the shell body f by a process of cold pressing with its reinforced bottom 7 and with side walls 8 tapering in upward direction to gradually merge into the thickness of the wall of the shell body proper. The thickness of the material forming said bottom in conjunction with the reinforced side walls 8 is so dimensioned, that during the subsequent working step a change in form will be possible by means of which the seat or receptacle 5 for the priming cap as well as the outer rim 4 may be made from material forming part of said bottom. Subsequent to this, an annular contraction 9 is pressed or rolled into the wall of the shell by a further working step as indicated in Fig. 6. The annular contraction 9 constitutes the upper boundary for the powder charge and simultaneously serves as a support for a disk or plug to be placed intermediate the powder filling and the charge of small shot of the completed cartridge.

When pressing in the annular contraction, the length of the shell, as may be seen from a comparison between Figs. 5 and 6, will be shortened a small distance which should be taken into consideration when making the shell by said former process of cold pressing. The annular contraction or groove 9, as shown in Fig. 6, will permit an eventually undesirable resilient expanding or stretching of the shell during firing, which, however, may be avoided if instead of said annular contraction or groove the shell is provided with a special supporting rim for the disk between the powder and the small shot as shown in Figs. 7, 8, 10, 11 and 12 in a longitudinal section. In the present case the shell is made the same as according to Fig. 7 as a single piece by means of the process of pressing from cold material and is further provided with a reinforced bottom plate 2 carrying a seat or receptacle for the priming cap, the likewise reinforced lateral wall tapering in cross-section to merge into the wall f of the shell proper. Above the reinforced bottom which comprises the bottom plate 2 and the lateral wall 6 an annular groove 9 is pressed into the wall of the shell f as shown in Fig. 8, said groove extending in the form of an inwardly projecting annular rim causing a shortening of the original length of the shell by a distance a as represented at the top of Fig. 8. Said annular groove 9 is now compressed by a further working step as indicated in Fig. 9 and from the enlarged partial cross-section shown in Fig. 10, so that there will be a further shortening of the shell by a distance a^1 causing the upper and under facing surfaces of said groove to come in contact with each other as shown in Fig. 10. At the same time there will be formed an inwardly projecting annular rim 9^1 on the shell, which rim as a whole may be bent upward or downward as shown in Fig. 12 in an enlarged partial cross section of the shell, with the result that a compressed fold $9''$ is formed by the wall of the shell, said compressed fold being bent down against the inner surface of the wall of the shell to form a supporting rim or collar for the disk or plug to be placed between the powder charge and the small shot. In addition to this, said compressed fold shown in Fig. 12 will safely prevent the aforementioned stretching of the shell in longitudinal direction during firing.

I claim:

1. A cartridge shell formed from a single piece of metal and having a reinforced bottom, and a cylindrical wall reinforced along the portion defining a powder chamber, said cylindrical wall adjacent the upper end of said powder chamber being deflected inwardly to form a fold and said fold being bent over in contact with the wall to define a shoulder on the inner surface of said cylindrical wall, thereby forming a seat for the disk separating the powder chamber from the shot chamber.

2. A cartridge shell having a bottom and a cylindrical wall defining a powder chamber, said cylindrical wall adjacent the upper end of said powder chamber being deflected inwardly and folded flat against the inner surface of said wall to define an annular shoulder on the inner surface of said wall and to present a smooth outer surface of uniform diameter.

3. A cartridge shell formed from a single piece of aluminium and having a reinforced bottom, and a cylindrical wall reinforced along the portion defining a powder chamber, said cylindrical wall adjacent the upper end of said powder chamber being deflected inwardly and folded flat against the inner surface of the cartridge wall to define an annular shoulder on the inner surface of said wall and to present a smooth outer surface of uniform diameter.

EMIL LEUSSLER.