(No Model.)

W. HEBLER.

METHOD OF MAKING COMPRESSED CARTRIDGES.

No. 306,827. Patented Oct. 21, 1884.

Fig. I.

Fig. V.

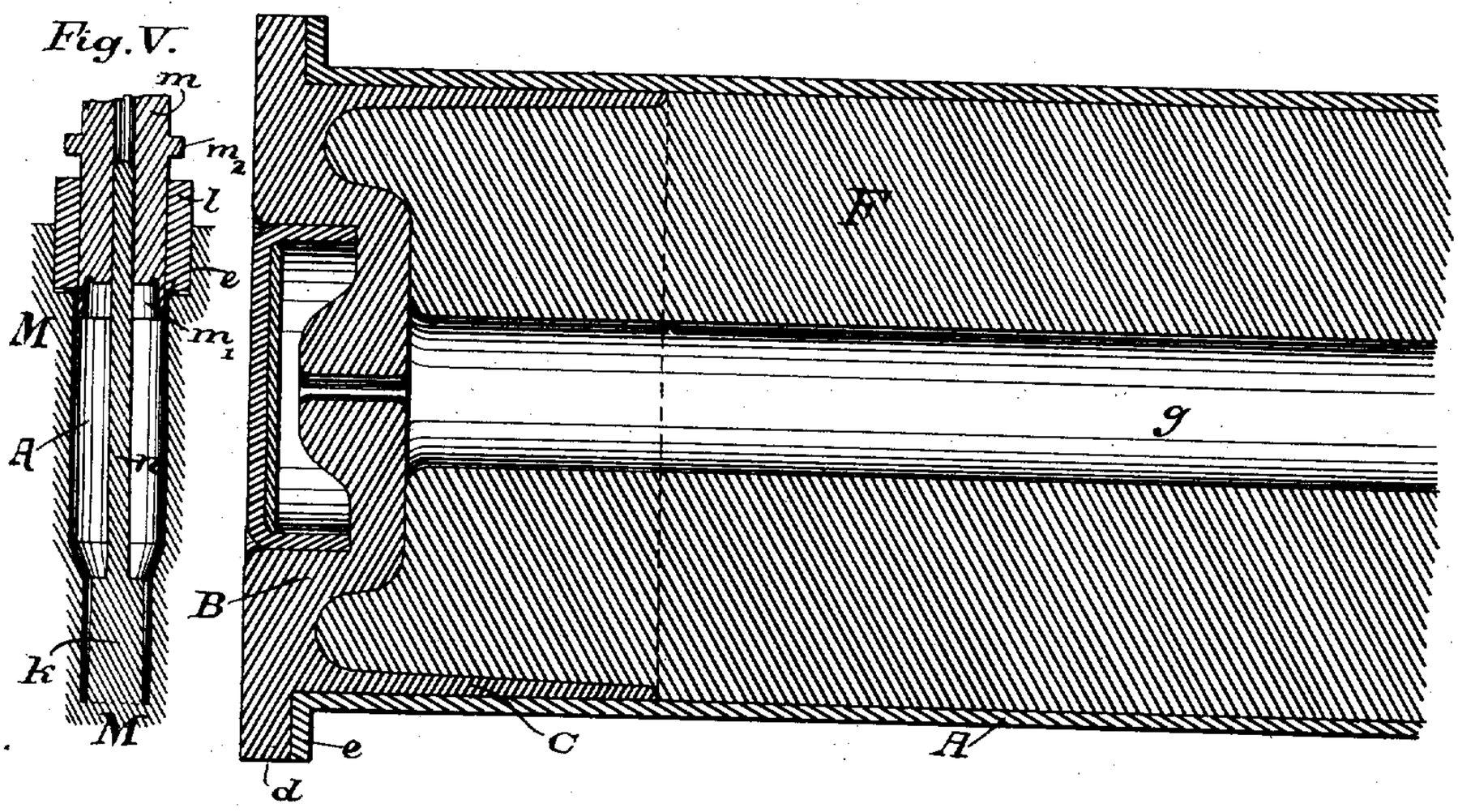


Fig. II.

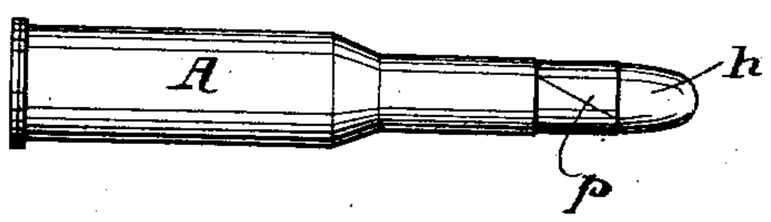


Fig. III.

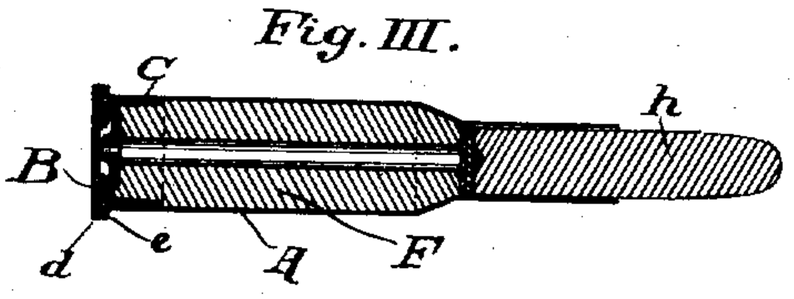
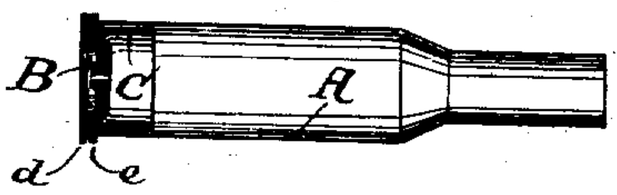


Fig. IV.



Attest;
René Geelhaar
E. Leibundgut

Inventor;
William Hebler
by Brustlein Surry & Co. Attys

UNITED STATES PATENT OFFICE.

WILLIAM HEBLER, OF ZURICH, SWITZERLAND.

METHOD OF MAKING COMPRESSED CARTRIDGES.

SPECIFICATION forming part of Letters Patent No. 306,827, dated October 21, 1884.

Application filed March 25, 1884. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM HEBLER, a citizen of the Republic of Switzerland, residing at Zurich, in the canton of Zurich, in Switzerland, have invented certain new and useful Improvements in Method of Making Compressed Cartridges, of which the following is a specification.

My invention relates to cartridges of that class where compressed powder is used within a metallic shell; and it consists in the process of manufacturing said cartridges by first inserting the charge of powder in a moist condition from the rear end of the shell, and then in compressing the same within the shell at one stroke by means of suitable dies and molds in such a way as to secure perfect uniformity and evenness of manufacture.

The object of my invention is to provide a method of making compressed cartridges with greater perfection and by easier means than have been used heretofore. The methods applied for filling cartridge-shells with compressed powder have prior to my invention either required much labor or have not given quite satisfactory results, specially when filling cartridge-shells made in one part with their open end shrunk for holding the projectile. Since cartridge-shells were made in two parts—viz., with a separate piece forming the breech end of the cartridge, being fitted to the cylindrical part of the latter—some of the difficulties in using compressed powder have been overcome; but even in thus improved cartridges the operation of filling the same has not been quite satisfactory. Sometimes the charge of powder was brought in the cartridge in small quantities, which were gradually compressed after each filling, by which method much time was lost. Another method heretofore used consisted in preparing cylindrical blocks of compressed powder, which were inserted ready made into the shell. This method is objectionable on account of the special work required for making the blocks of compressed powder, and also because the latter would not fit exactly in the shell. A certain space would be left at the bottom and the sides of the shell, and the powder would therefore burn off unevenly, causing great differences in the initial velocity of the shots.

I shall proceed to describe first the kind of cartridge-shells which I prefer to use in carrying on my invention.

The cartridge-shell of metal is made of two parts, the cap containing the priming device closing the back and inserted into the cylindrical part containing the charge and the ball by means of a thin annular rim fitting tightly and closely into said cylindrical part. The cap is further provided with a narrow rim projecting over the circumference of the cylindrical part, and this latter has its adjacent rim bent outward, so as to correspond with the rim of the cap. This outwardly-bent rim of the cylindrical part will cause said part to be caught, together with the cap, by the extractor of the fire-arm when the cartridge has been fired, and when firing the cartridge the expanding gases will make a hermetical joint between the cap and cylindrical part by expanding the projecting annular rim of the cap, whereby this latter is fitted into the back end of the cylindrical part. With regard to the compressed block of powder, it may be stated here that I prefer to leave a narrow cylindrical space within the same, which device secures a quicker combustion of the powder than if the block of powder were made solid.

The means and the process of filling the cartridges are as follows: The cylindrical part of the cartridge-shells to be filled is placed with the narrow fore end downward into a mold or hole, which is of the exact shape of the outside of the inverted cylindrical part when already compressed at its fore end for the reception of the ball. The outwardly-bent back rim of the cylindrical shell rests on a recessed part of the mold or hole, and an annular piece the inside diameter of which is equal to that of the shell is placed on top of the outwardly-bent rim of the shell, so as to form a cylindrical extension of the shell. A core is provided inside of the mold concentrically to the hole and rigidly fast to the body of metal forming and inclosing the hole or mold, said core being of such a shape that all space is filled by said core inside of the cylindrical

shell except the space needed for the powder itself. The necessary quantity of ordinary rifle-powder moistened with four per cent. water is put inside the shell and compressed at one pressure by means of a die or mandrel, which fits over the core within the shell, and the bottom face of which has the exact shape of the inside surface of the metal cap forming the back cover of the cartridge. Said die further is provided with an annular projection on its outside to mark how deep said die has to be pressed into the shell and preventing it from getting deeper by contact with the annular piece which had been placed on the outwardly-bent rim of the shell. The shells thus filled are then taken out of the mold and left for drying, whereupon the cap and ball are put on and the cartridge is completely finished. Thus all cartridges are treated and all will thereby become equally compressed and can be easily and quickly filled.

In the drawings annexed to this specification, Figure I represents a section through the back end of one of my cartridges; Fig. II, a view of a finished cartridge; Fig. III, a length section through the same. Fig. IV represents a section through the empty shell. Fig. V illustrates the process of filling the shells.

Similar letters of reference in different figures indicate similar parts.

In Fig. I, A represents the back end of the cylindrical part with outwardly-bent rim *e*. B represents the cap fitted into the back end of the cylindrical part A, said cap being provided with a suitable priming device, the special construction of which I do not claim, but simply state that I prefer the central priming, as it corresponds best with the shape of the hollow block of compressed powder. *d* represents the rim of the cap projecting over the diameter of the cylinder, and serving, together with *e*, as means for the extractor to extract the shell. C is a thin annular part on the cap B, fitting tightly into the inside of the cylindrical part A, said annular part C expanding when the charge of powder F explodes inside of the shell, and making a hermetical joint with the shell A, owing to the inside pressure of the gases developed by the explosion. *g* marks the narrow hollow cylindrical space inside of the charge of powder, which secures a rapid combustion of the powder.

In Figs. II and III, *h* represents the ball inserted into the cartridge-shell after the same has been filled, and said ball held fast by a contracted portion on the cylindrical part A. On Fig. II, further, the paper wrapper *p* may be seen, which I prefer for forming the intermediate layer between ball and shell.

In Fig. V, M marks part of the matrix forming the mold for reception of the shells to be filled, said mold being connected rigidly with the concentrical core *k* and *n*, *k* forming the part the place of which is taken afterward by the ball *h*, and *n* forming the part for spacing inside of the block of powder the hollow cylindrical space *g*. A represents the cylindrical part of the shell, placed into and exactly fitting the mold M, said shell resting, with the outwardly-bent rim *e*, within the recess of the mold, and being held in place by the annular piece *l*, fitting into the recess of the hole. *m m′ m²* mark the die or mandrel used in compressing, said die made hollow, so as to fit core *n*, and with an annular projection, *m²*, on its outside, so as to gage the degree of compression of the powder. *m′* is the bottom face of the die, made of the exact shape of the inside surface of cap B. It will therefore be seen that the process of filling the cartridges by means of mold M with core *k n*, and by means of annular piece *l*, placed on rim *e* of shell A, and by means of the die or mandrel *m m′ m²* is a very easy one, securing a perfect, equal, and even product, said process facilitating the use of compressed powder and permitting to provide a hollow cylindrical space within the charge of compressed powder without any extra trouble.

I am well aware that cartridge-shells have been made in two parts with a view of introducing the charge from behind, in order to enable to shoot a forced wad, said shells mainly consisting of a flanged cylindrical part, into the rear end of which a flanged cap containing the priming device was inserted. I disclaim the same; but

What I claim is—

In the manufacture of cartridges with two-parted shells, the process of charging the same with ordinary rifle-powder and converting said charge into compressed powder, said process consisting of placing the empty inverted cylindrical part of the shell into a suitably-shaped mold, of filling the shell with the desired charge of ordinary but moistened rifle-powder, of compressing said charge at one stroke by means of a suitably-shaped die, and of closing the cartridge at the rear end by means of the cap containing the priming device, as set forth and described.

In testimony whereof I hereunto sign my name, in the presence of two subscribing witnesses, this 31st day of January, 1884.

WILLIAM HEBLER.

Witnesses:

EMIL BLUM,

EDUARD EGLI.