

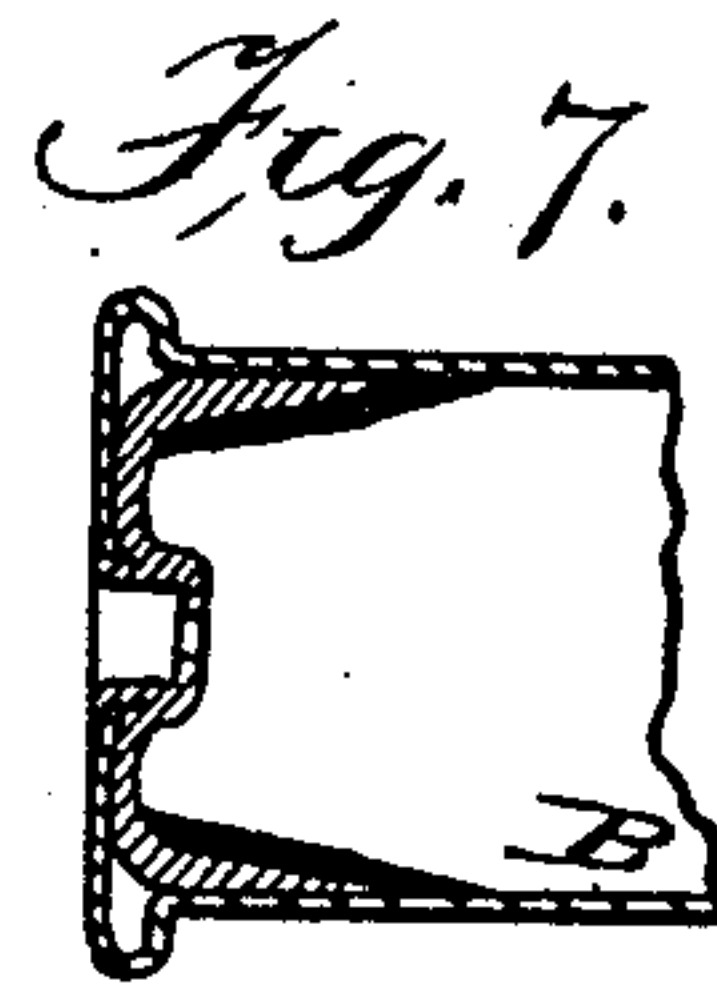
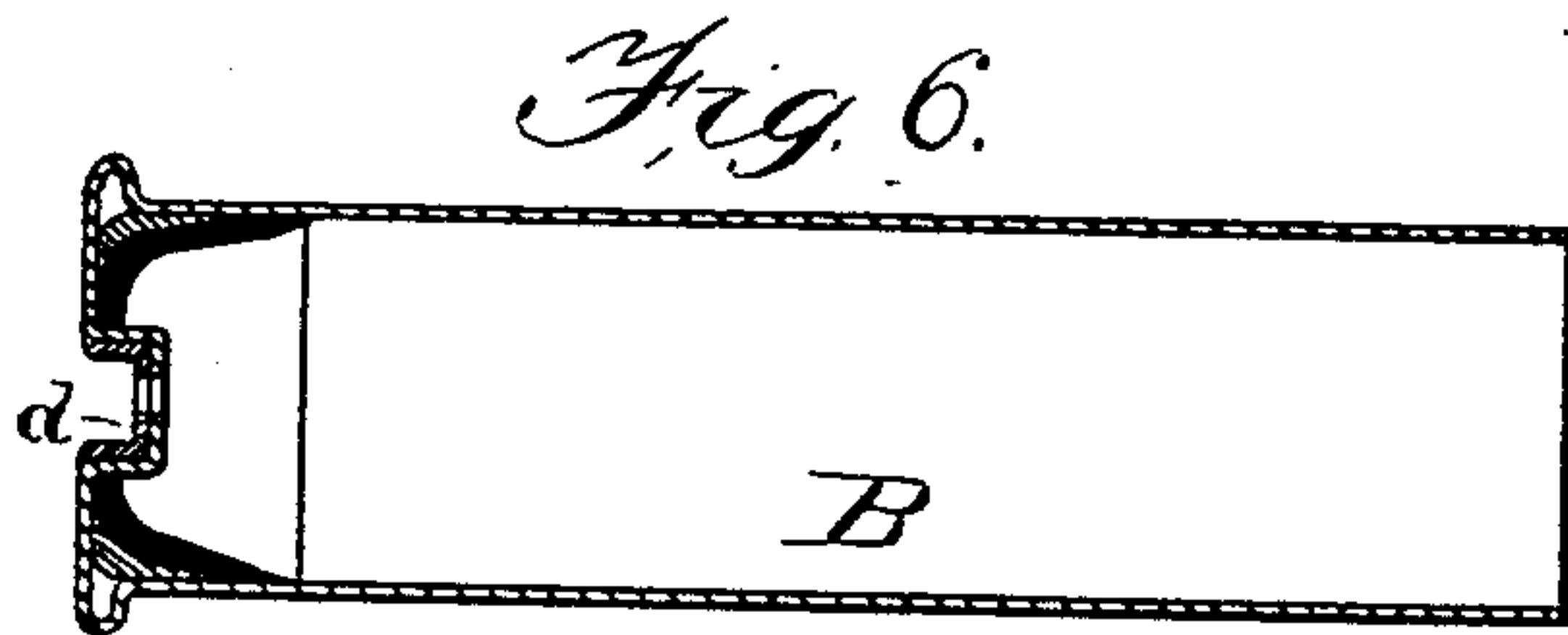
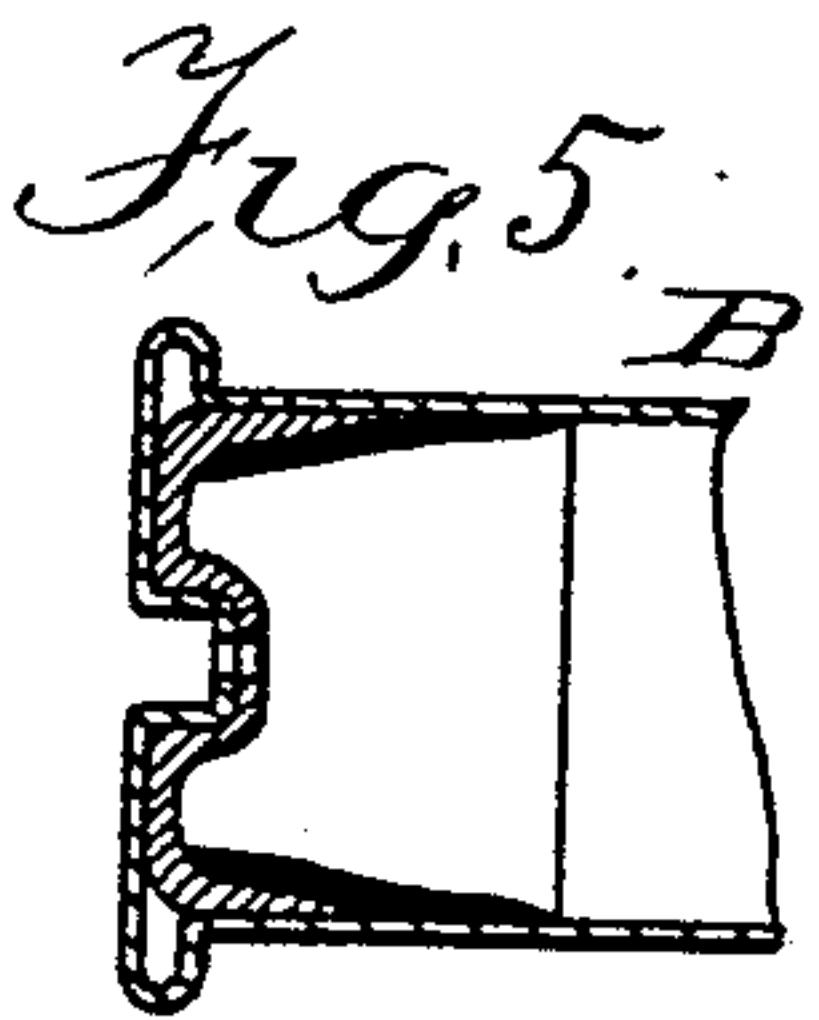
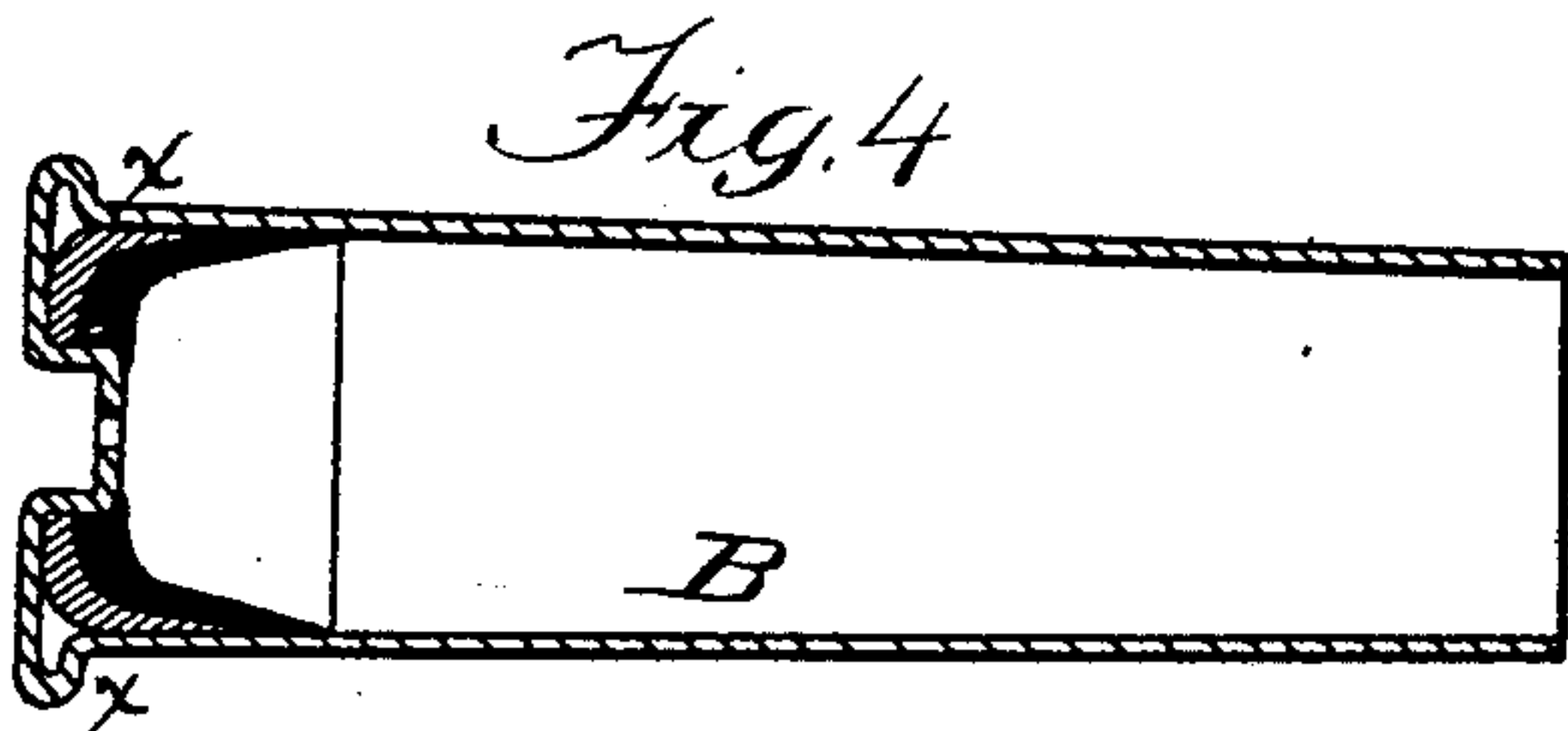
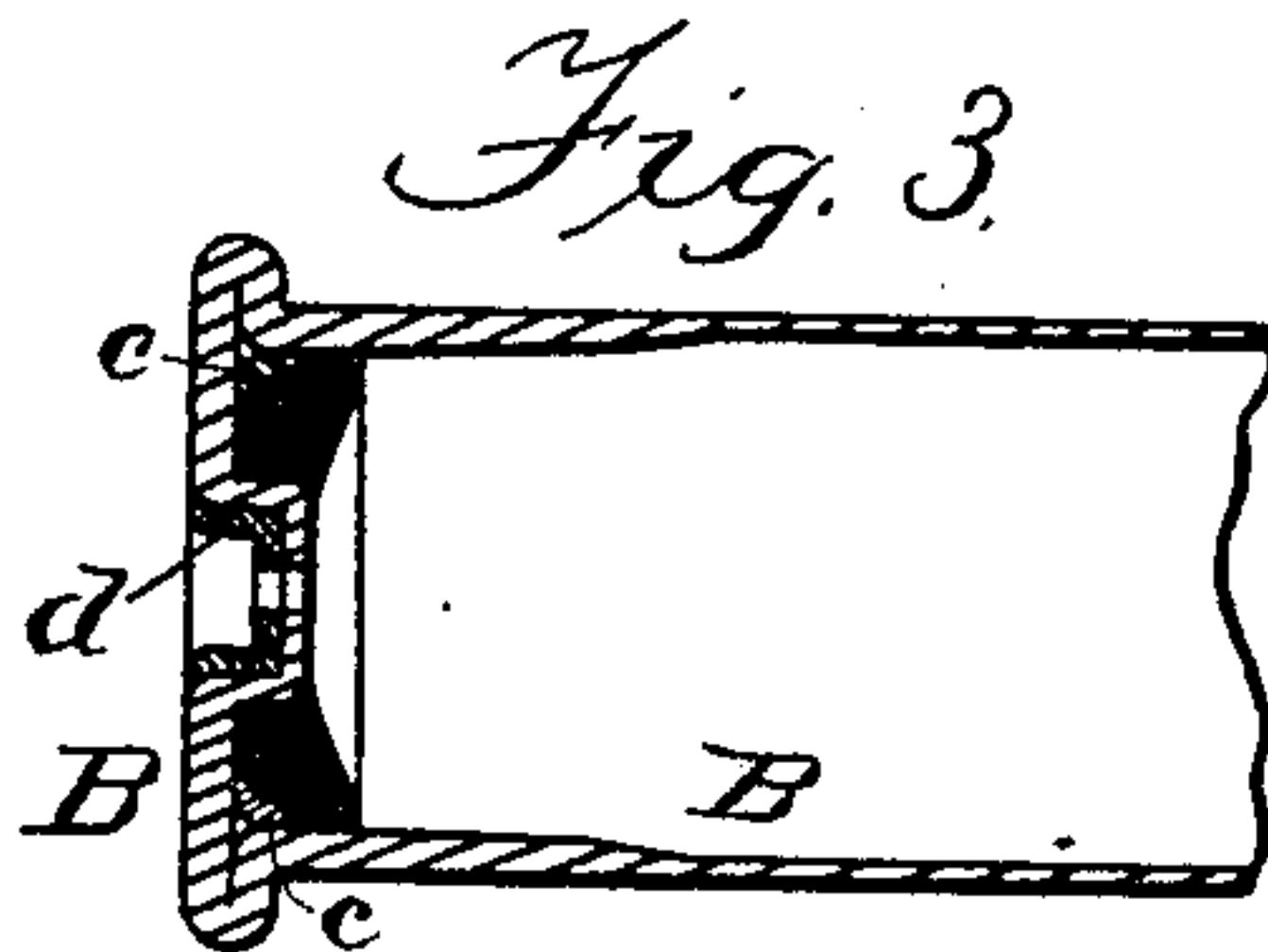
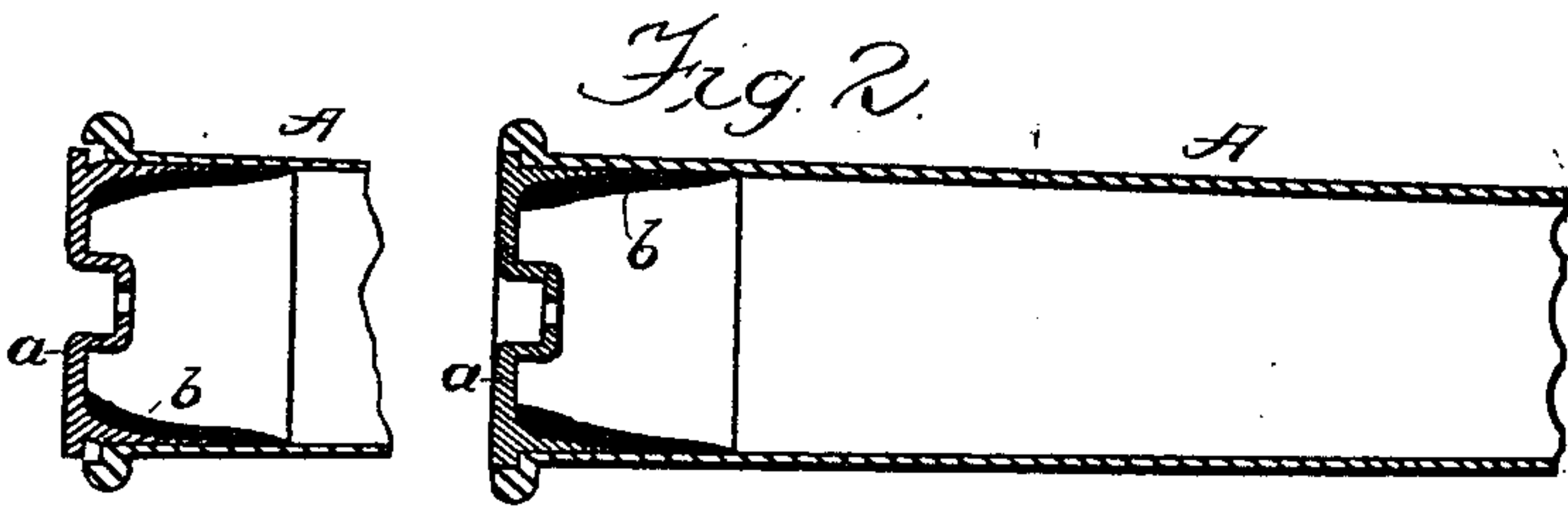
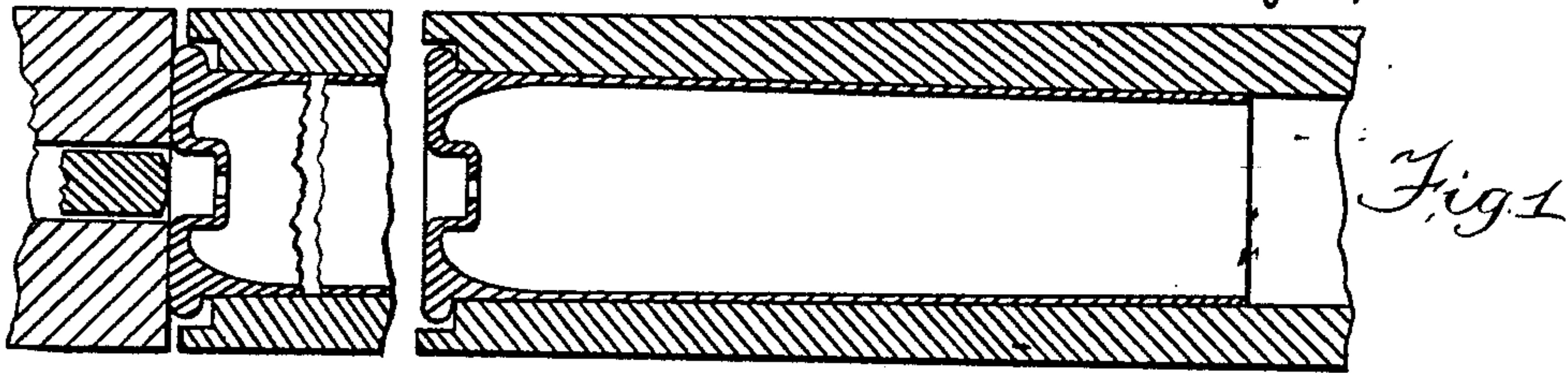
(No Model.)

G. W. MORSE.

RELOADING CARTRIDGES.

No. 345,165.

Patented July 6, 1886.



Witnesses:
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UNITED STATES PATENT OFFICE.

GEORGE W. MORSE, OF WASHINGTON, DISTRICT OF COLUMBIA.

RELOADING-CARTRIDGE.

SPECIFICATION forming part of Letters Patent No. 345,165, dated July 6, 1886.

Application filed October 1, 1884. Serial No. 144,446. (No model.)

To all whom it may concern:

Be it known that I, GEORGE W. MORSE, a citizen of the United States, residing at Washington, in the District of Columbia, have invented certain new and useful Improvements in Reloading-Cartridges; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in expansive cartridges for breech-loading fire-arms of the character described in my Patents Nos. 15,995 and 15,996, of October 28, 1856, and those now in general use, and is intended to obviate certain defects which have been developed in practice or long use, which defects, so far as I am aware, have never been successfully remedied.

In the gun described in my Patent No. 15,995, as well as those now in common use, powerful devices for inserting and holding the cartridge in a fixed position longitudinally at the instant of explosion in the gun were provided. Notwithstanding this provision the head of the cartridge was always driven back by the explosion a distance equal to the distance of the face of the breech-block from the rear end of the cartridge, together with the distance that the breech-block yields to the force of the explosion, by reason of elasticity of the parts or otherwise, while the sides or walls of the case were immovably held against the interior walls of the gun by the lateral pressure of the gases resulting from the explosion.

Owing to practical difficulties in the manufacture, there is more or less variation in the thickness of the heads and flanges of different cartridges of a given size. A corresponding variation in the size of the cartridge-chambers of different guns intended to be of the same dimensions, and in the distances from the face of the breech-blocks to the ends of the barrels, results from similar causes. Because of these facts, there always exist measurable differences between the size of the cartridge and the size of the gun-chambers, and also measurable distances between the front end of the breech-block and the rear end of the cartridges when they are in their most forward position in the gun, so that the maxi-

imum size of cartridge may be sure to enter the minimum size of the gun-chamber for which it was intended. The space between the head of the cartridge at the moment of explosion and the face of the breech-block often exceeds two hundredths of an inch. When the gun is fired, the cartridge is usually driven forward by the gun-hammer, and the after part of the cartridge-case is driven back against the breech-piece by the explosion, as described in my Patent No. 15,996, while its walls are firmly held against the sides of the gun-chamber. This action did not materially affect the short cartridges used in large-bored rifles at the time my breech-loading system was first patented in 1856, for the whole body of those short cases would move back without breaking; but with long cartridge-cases, now in use in small-bored long-range rifles, the shell or case is so firmly held to the interior of cartridge-chamber in the whole length of its easily-expansive portion that it stretches or lengthens at each fire just where the thicker and less-easily expansive after part near the head joins the thinner and more-easily expanding portions of the case, and it breaks at that point, sometimes at the first, and generally after a few fires, leaving the case so firmly clinging to the interior of the cartridge-chamber that it is difficult to remove, rendering the arm useless until it is taken out. This action is very objectionable in all arms fired from the shoulder, but is of the greatest importance in machine-guns and repeating fire-arms.

My present inventions are intended to remedy this defect; and they consist, first, in providing for a backward movement of the interior after portion of cartridges at the instant of the explosion of the charge, without permitting the escape of gas or producing any backward strain upon the case or shell; and, second, in providing for the rearward expansion of the head of folded-head cartridges, without allowing any of the gases of the charge to reach the fold in the head of the cartridge.

In the drawings, Figure 1 represents a section of an ordinary re-enforced solid-head cartridge in its chamber, and the same as broken after firing. Fig. 2 represents a section showing my invention as applied to cartridges wherein a re-enforced flanged cup having a

cap-pocket is used, and the same as driven back by the force of the explosion and expanded to fill the case after firing. Fig. 3 represents a folded-head cartridge re-enforced by a metallic ring having both edges or joints covered by sensitive packing and the cap-pocket re-enforced by an inserted cup. Fig. 4 represents in section a folded-head cartridge made of thin metal having a re-enforcing ring or cup and sensitive packing inserted according to my invention. Fig. 5 is a similar view showing my re-enforcing ring or cup so formed and applied as to re-enforce the cap-pocket. Fig. 6 is also a section of a cartridge of very thin material re-enforced at the fold and cap-pocket. Fig. 7 is a section showing a folded-head cartridge and a form of re-enforcing-cup having the cap-pocket made therein.

A is the open-ended tubular body of a cartridge, and *a* is a cup for closing the head of the same. The after part of this cup is made of sufficient substance not to burst and leak at the breech-joint; its front end is made very thin, so as to be easily expanded by the rubber or other suitable sensitive packing, and it is provided with a cap-pocket, and preferably with a flange to rest against the end of the body, and by preference is of such thickness that the cap-pocket will resist the action of the gun-hammer and priming without being re-enforced.

B B are the shells of folded-head cartridges. That shown at Fig. 3 is of comparatively thick or heavy metal.

b b, in the several figures, are forms of sensitive packing, so made and combined as to lap over or cover the joints between the body of the case and the movable head ring or cup. This packing is preferably made of elastic vulcanized rubber, and must be in close contact with the parts and of such sensitive or readily-yielding or plastic material as to remain in close contact with the body and re-enforce at the moment of and during the explosion, and thus operate as a valve to keep the gases from getting between it and the more rigid parts. The edge of the re-enforcing cup or ring will be carried outward by the packing at the moment of explosion with the walls of the outer shell.

In Fig. 3 I have shown the re-enforce *c* in the form of a ring, and in the following figures in the form of a cup with very thin edges adjacent to the shell. The ring is thinned down on its upper edge, has its back corner taken off, and reaches far enough into the case to more than cover the fold in the cartridge-head, so that the force of the explosion cannot drive it into the fold. I have also shown in the same figure and in Fig. 6 a re-enforce, *d*, for the cap-pocket, consisting of a cup inserted from the outside to a pocket made somewhat larger than required for the cap. This pocket must be re-enforced in cartridges intended to be reloaded and refired, when the shell or head is made of metal of the thickness ordinarily used for folded-head cartridges.

In Fig. 4 I have shown a shell made of metal

of the ordinary thickness for folded-head cartridges, or about two hundredths of an inch thick. As the flanges of all cartridges of a given caliber are of about the same exterior dimensions, there will be a space, as shown in this figure, between the thicknesses of the fold. In cartridges of this character I use, instead of the ring shown in Fig. 3, a cup-like re-enforce on the inside somewhat like the closing-cup shown in Fig. 2, strong at the bottom and extending well up into the case, to protect the corner at *x x* by preventing expansion at that point. If, however, the main cartridge-case is made of very thin metal, as shown in Fig. 6, a re-enforcing cup which will expand throughout may be used.

In Fig. 5 I have shown the re-enforcing-cup made so as to support the cap-pocket from the inside, so that a separate outside cup, *d*, may be dispensed with, and in Fig. 7 I have shown the re-enforcing-cup as provided with a cap-pocket and as being connected with the outer case by riveting or eyeletting. It is obvious that a flanged cup having a cap-pocket may be used and the end of the shell just bent over the base of the same instead of the form shown at Fig. 8. In all these I have provided for a movement of the head or base with relation to the walls or body of the cartridge-case, so that no undue strain will be exerted to part the shell, as indicated in Fig. 1, nor at the bend of the flange.

When the charge is fired, the rubber first yields to the force of the gas and pushes out the metal ring or cup, while the head is driven back against the front face of the breech-block.

The cartridge thus made may be resized by first compressing the head and then reducing the diameter of the body, and will withstand strains of repeated explosions, so that it may be reloaded and refired many times.

In the manufacture of the cartridge shown in Fig. 2 the cup-head is forced into the rear end of the case sufficiently tight to be firmly held in position and exclude moisture, but not so as to distend the rear end of the case beyond its proper dimensions, which must always be less than the chamber of the gun in which it is to be used.

When the charge is fired, the great interior surface of the cartridge-case is exposed to the force of the gas, and this expands it out to the sides of the chamber and leaves an opening between the interior of the case and the front end of the cup, however thin it might be made; but my sensitive rubber or other packing prevents the gases of the charge from entering this crack. The cup, however, is loosened, flies back against the breech-block, and expands to fill the enlarged case. The outer case may therefore be made of metal only sufficiently thick to protect the charge from rough handling. When the cartridge is resized, the cup is forced back to its original position and firmly held by the reduced case.

Crimping the front end of the case into the

ball has heretofore caused considerable longitudinal strain upon the case. I propose to scallop the end of the case, as shown in Fig. 2, and crimp the points only into the groove in the ball. This will sufficiently confine the ball in the case, and will release the same more readily when the charge is fired.

I am aware that expanding metallic cups have been used to strengthen the rear end of folded-headed cartridges, and also to close the rear end of open cartridge-cases, notably such as are described in my Patent No. 20,214, of 1858, and that of Orcutt, No. 155,841, October 15, 1874; but my experiments have proved that when the charge is fired in cartridges so constructed the outer case expands away from the cup, leaving an opening for the gases of the charge between the inside of the case and the outside of the cup, so that but little, if any, benefit is obtained by the use of the cup, unless it is forced in so tightly as to expand the outside case till it fills the gun-chamber opposite to the front end of the cup; but with a supplemental sensitive packing to cover the joints this difficulty is overcome, and perfect sealing of the joints between the cup or ring and the walls of the case is obtained.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A cartridge-case consisting of the combination of a tubular body part, a head or bottom movable with relation to said body, and a tubular, funnel, or cup shaped gasket of soft vulcanized rubber or other like easily-yield-

ing plastic material for packing the joint between the parts, substantially as described.

2. In a cartridge, the combination of a body having a yielding folded head, a re-enforcing ring or cup, and a gasket of soft rubber or like sensitive plastic packing material overlapping the joints between the cup and outer case, substantially as described.

3. In a cartridge, the combination of a flanged tubular case, a head or base provided with a priming-pocket, and an easily-yielding gasket of soft rubber or like plastic packing material overlapping the joints between the head and base, substantially as described.

4. In a cartridge, the combination of a body or case having a yielding folded head, means for re-enforcing the case at the fold of the flange, as well as the cap-pocket, and an overlapping soft-rubber or like easily-yielding plastic packing for sealing the joints, substantially as described.

5. In combination with a cartridge, substantially as described, a tubular, funnel, or cup shaped gasket of soft vulcanized rubber or other like plastic packing material for overlapping the joint and preventing the leakage of gas at the joints of cartridges, as herein set forth.

In testimony whereof I affix my signature in presence of two witnesses.

GEO. W. MORSE.

Witnesses:

V. D. STOCKBRIDGE,
WM. A. ROSENBAUM.