

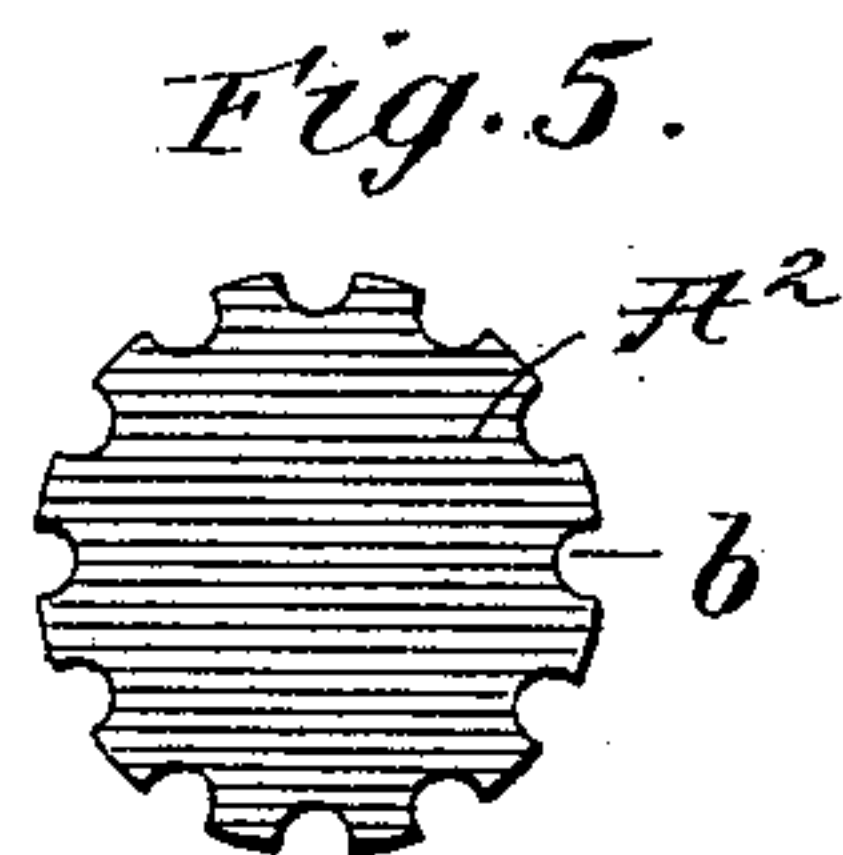
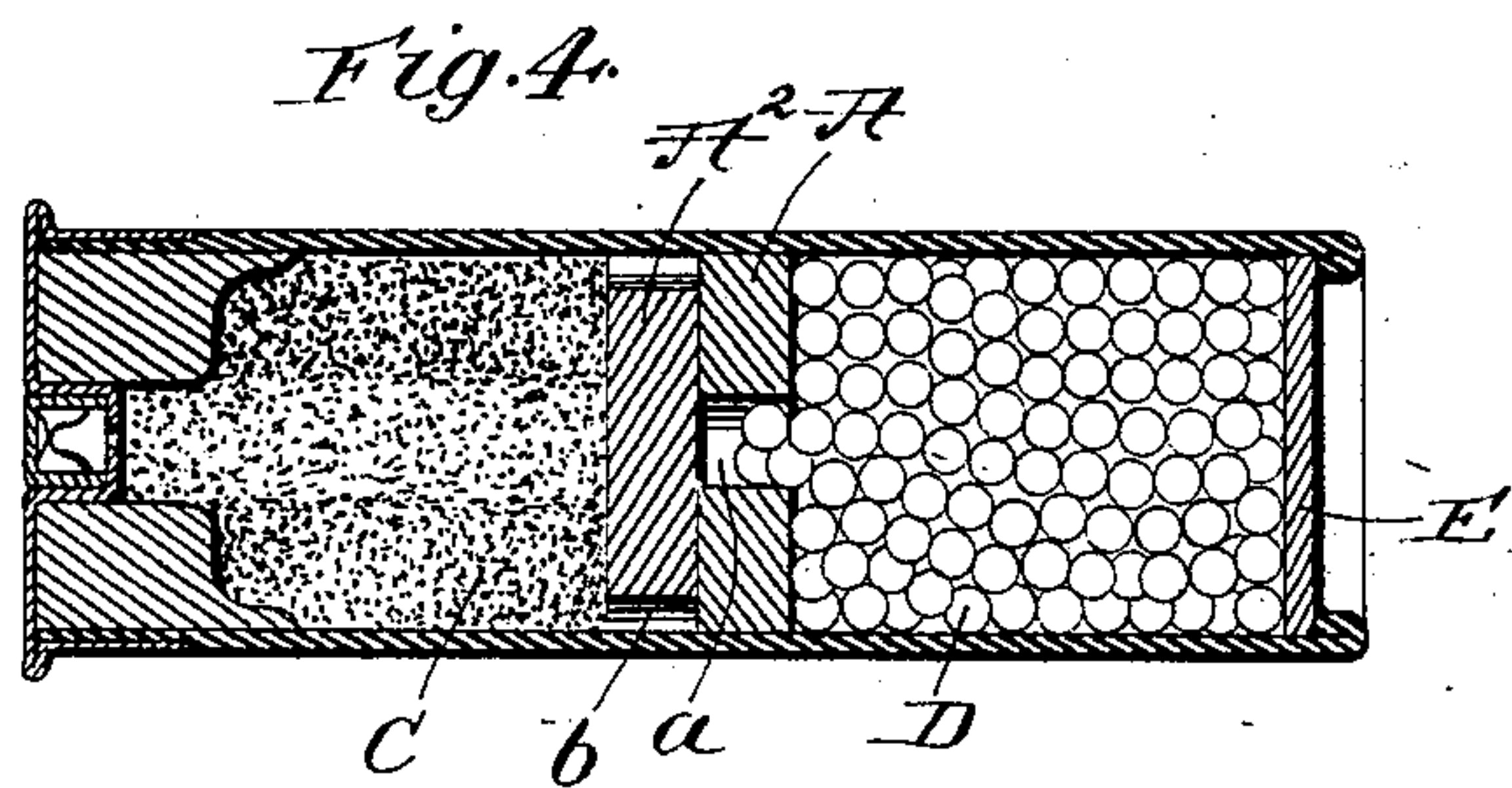
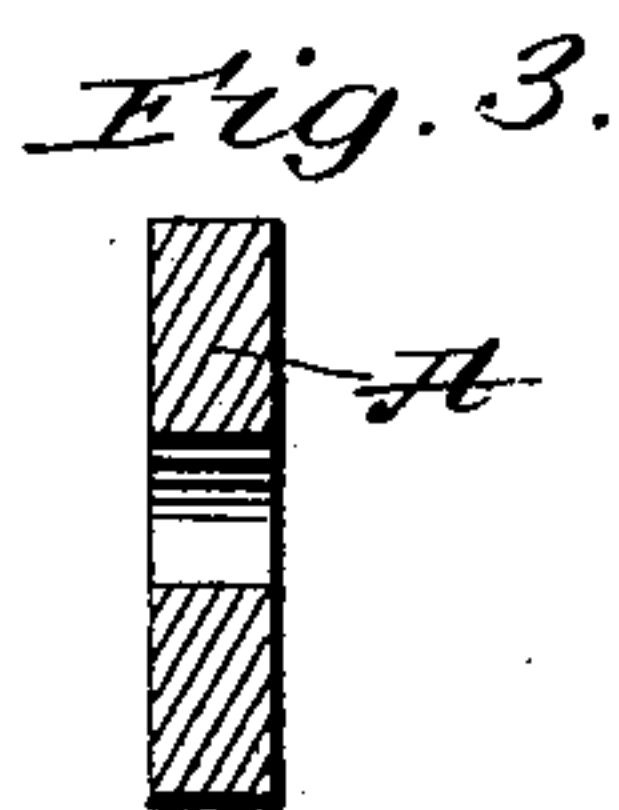
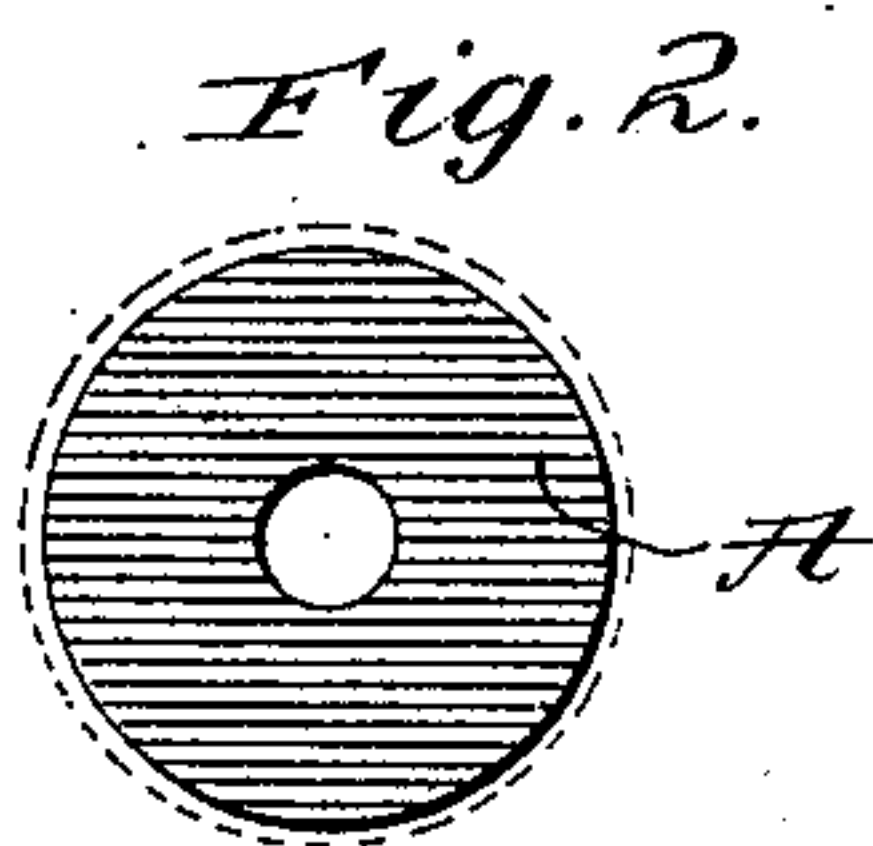
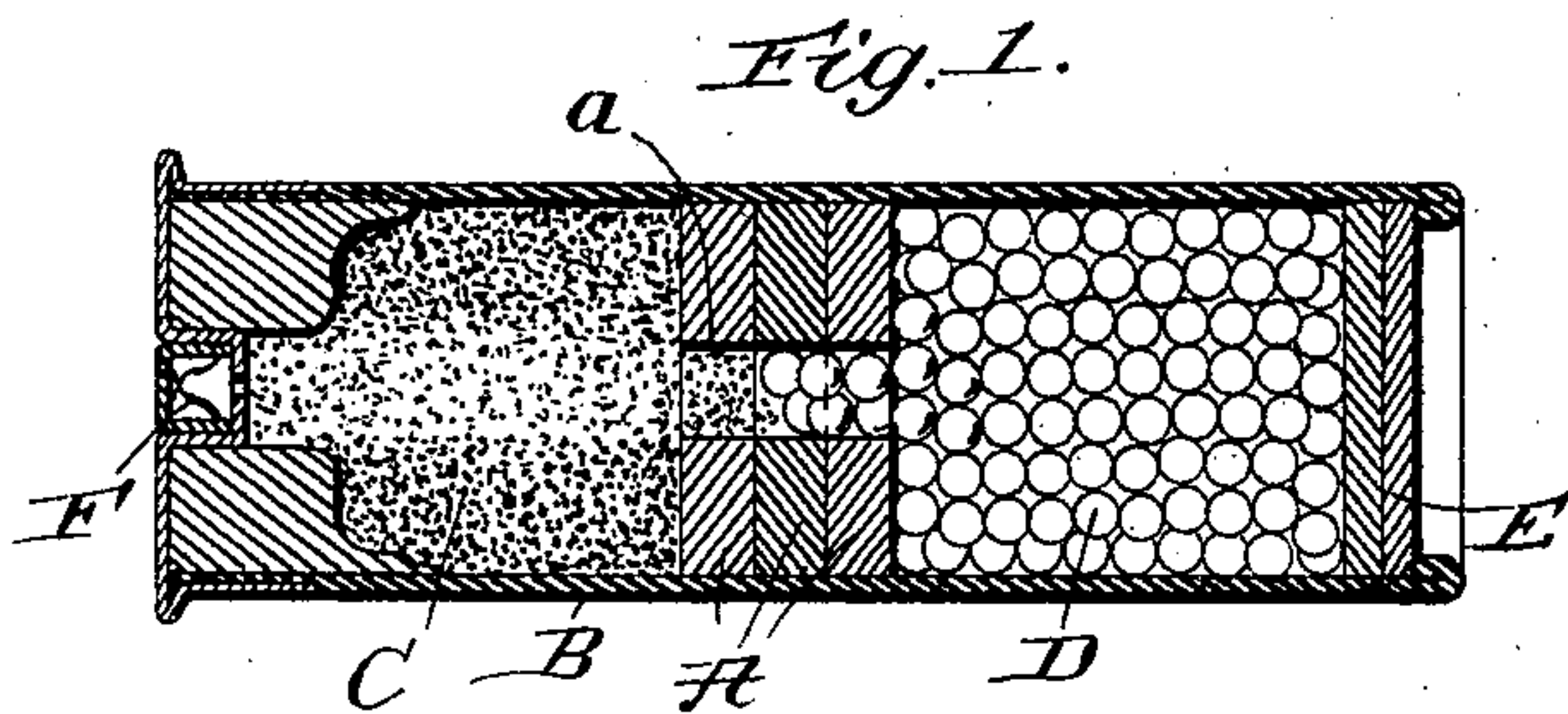
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PATENTED DEC. 6, 1904.

C. LA DOW.
ART OF CONTROLLING THE FLIGHT OF CHARGES OF SHOT OR OTHER
PROJECTILES.

APPLICATION FILED JAN. 7, 1904.

NO MODEL.



Witnesses
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UNITED STATES PATENT OFFICE.

CHARLES LA DOW, OF ALBANY, NEW YORK.

ART OF CONTROLLING THE FLIGHT OF CHARGES OF SHOT OR OTHER PROJECTILES.

SPECIFICATION forming part of Letters Patent No. 777,029, dated December 6, 1904.

Application filed January 7, 1904; Serial No. 187,998. (No model.)

To all whom it may concern:

Be it known that I, CHARLES LA DOW, of the city of Albany, in the county of Albany and State of New York, have invented a new and
5 useful Art of Controlling the Flight of Charges of Shot or other Projectiles, of which the following is a specification.

In the practical use of firearms employing projectile charges made up of a number of
10 separate projectiles—as, for instance, shot—it is sometimes desirable to cause a spreading of the projectiles to cover a relatively large area, and at other times it is desirable to cause them to maintain a comparatively compact
15 formation and to be thrown either as a substantially solid body or to cover a relatively small area, according to the nature of the target or game or special conditions under which the shooting takes place.

20 I have discovered a new principle of controlling the flight of the shot or projectiles and have developed an art or method of embodying or utilizing said principle and a means for so doing. Briefly stated, the principle is
25 this: If a portion of the gases incident to the burning or explosion of the powder charge be permitted to enter the shot charge at or near its longitudinal axis—that is, the axis of the gun—the shot on leaving the muzzle of the
30 gun will be caused by the gas to spread outward or diverge, and consequently to cover a relatively wide area at ordinary ranges, while if a portion of the gases be permitted to encompass the shot charge or to enter at or near
35 its circumference the shot on leaving the muzzle of the gun will be in considerable degree held together and will move in a compact or relatively compact body, consequently covering a relatively small area at ordinary ranges.
40 Between the two extremes thus produced variations may be secured by causing a portion of the gases to enter the shot charge at points intermediate the center and the circumference of the charge. These results may be attained
45 either with fixed or with loose ammunition, provided only the escape of gas into or around the shot charge be properly controlled and directed. It will be found convenient ordinarily to use fixed ammunition, and for this
50 reason I have illustrated my invention as em-

bodied in a shot-cartridge; but I do not mean to be understood as restricting myself thereto.

The present application is restricted to the art or method as applied to spreading or scattering of the charge, a divisional application
55 having been carved out of this in accordance with official requirement to cover the art or method as applied to concentration or close shooting.

In whatever way the invention may be embodied I find it convenient to control and direct the escape of gases from the powder charge into the shot charge by the interposition of a wad or wads having a central perforation or opening of some form at or near the
60 center or axis of the charge or load. I have found also that the thickness of the wad or wads, the area of the opening or openings, and, to some extent, the character of the wads—that is, whether more or less elastic—all in-
65 fluence the results in greater or less degree, it being advantageous generally to employ wads which possess considerable elasticity—as, for instance, the well-known felt wad of
70 commerce.

In the accompanying drawings, Figure 1 is a longitudinal sectional view of a cartridge loaded to carry out my invention; Figs. 2 and 3, face and sectional views of a wad or separator suitable for such loading; Fig. 4, a longi-
75 tudinal section similar to Fig. 1, but showing a modified form of wad or separator; Fig. 5, a face view of one member of such modified separator.

Referring now to Fig. 1, B indicates a cartridge-shell, here represented as of the com-
85 mon paper type, with sheet-metal head and coiled paper base, which type of shell I prefer to use in practice, though a metal shell or any other well-known form of shell may be
90 employed. A indicates a wad of the form shown in Figs. 2 and 3—that is to say, having a central perforation *a*. In Fig. 1 three such wads are shown interposed between the powder charge C and the shot charge D, retaining-
95 wads E being placed in front of the shot and held in place by crimping down the forward end of the shell B in the ordinary way. The shell is, as usual, made of such length as just to fill the shell-chamber of the gun when the
100

crimped end is straightened out by the outward movement of the charge. As shown in Fig. 1, the three wads A, each with a central perforation, produce a somewhat-extended central passage from the powder charge to the shot charge. When the powder is introduced into the shell and the wads are placed upon it and subjected to pressure, as is customary, that portion of the powder lying beneath the imperforate body of the wads is subjected to a considerable pressure, whereas the central or axial portion of the powder charge receives no direct pressure and remains relatively loose notwithstanding the tendency of the grains or particles of powder to move inward in greater or less degree. The result of this is that the central core or portion of the powder charge, which is first ignited by reason of the central position of the primer F, ignites and burns more freely or promptly than the portions nearer the circumference, and in this way the proper and complete burning of the powder progressively from the center toward the circumference is insured. While the action takes place in an exceedingly short space of time, there is nevertheless a progressive action and a full and proper generation of the gases without the relatively great shock or strain occasioned by the practically instantaneous ignition and burning of the whole charge. When the centrally-perforated wads are pressed down upon the powder charge, a small portion of the powder enters the central passage or opening in the wads, as indicated in Fig. 1, and similarly some of the shot enter the forward end of said passage when the shot are introduced. The parts of the charge are held properly in place by the wads E and the crimping or inturning of the forward end of the shell, as indicated. When a cartridge thus loaded is fired, a portion of the gas, escaping from the powder-chamber into the shot charge at the center, acts upon the shot as they emerge from the muzzle of the gun and pressing outward as well as forward tends to separate the shot and cause them to diverge slightly from a straight forward movement. As a consequence the shot will at ordinary ranges cover a relatively wide area.

Fig. 4 shows a modification of the loading, consisting in employing as a separator between the powder and shot charges a compound wad A A², the wad A having a central perforation *a* and being placed next to the shot charge and the wad A² having peripheral notches *b*, as in Fig. 5, and being placed next to the powder charge. Upon ignition of the powder charge and formation of the gases a relatively small portion thereof will find its way through the passages formed by the notches *b*, thence between the wads A A², and finally through the central perforation *a* to the axis of the shot or projectile charge. By thus combining wads of two classes the danger or liability of undue escape of gases into and

through the shot charge will be overcome. In practice, however, this has not been found a serious difficulty or one rendering necessary any special prevention, though in heavier charges and with powder of different qualities or character it may be more important to use the combination of wads illustrated and described in connection with Fig. 4.

It is particularly to be noted that under my system of loading the shot or projectile charge passes through the barrel of the gun and emerges therefrom entirely free of any wrapping, casing, or binding. This is considered highly important, as such cases, wrappers, or binders are found to affect injuriously the flight of the shot and to render the same variable and uncertain. It is also to be noted that the shell employed by me is not destroyed or injured in use, but may be reused in the same manner and to the same extent as any other shell of like character. So, too, the perforations, notches, and passages described are to be clearly distinguished from the notches or indentations commonly made in pasteboard wads and from perforations, slits, or notches made in metallic wads or disks to permit the escape of air and allow the wads or disks to be rammed home straight and true, as they could not be were no provision made for the escape of air from the barrel. So far as I am aware, such notches, slits, and perforations have never been made use of with a view to permitting passage of gases in definite and controllable degree and at predetermined points relatively to the circumference and the center of the shot charge to effect and determine accurately and certainly the degree of spreading or "balling" of the shot charge.

In compliance with the rules and practice of the Patent Office this application, originally including and claiming both the art or method of controlling the flight of projectiles, whether for spreading or concentration, and means for carrying said method into practice, is now restricted to the art or method of spreading *per se*, and the cartridges shown and described are to be understood as merely illustrative of some of the varied or variable means whereby the art or method may be practiced. The structures themselves are not specifically claimed herein nor are they to be understood as the only practicable embodiments of the invention, since, as a matter of fact, the possible variations are exceedingly numerous and have been made by me in great number and practically tested. These structures are made the subjects-matter of separate applications, and specific claim for the art or method as applied to the concentration or holding together of the projectile charge for "close shooting" is also made in a separate application filed in my name on the 31st day of October, 1904, and designated by Serial No. 230,714. The cartridges are made the subjects-matter of applications filed by me on the 8th day of Au-

gust, 1904, and designated, respectively, by Serial Nos. 217,971, 217,972, 217,973, and 217,974.

5 Having thus described my invention, I claim—

10 1. The art or method of controlling the flight of shot or other separate projectiles constituting a charge, which consists in directing a portion of the gases of the powder charge into the projectile charge at or near the center or longitudinal axis as the projectile charge is moving through the bore of the gun, and permitting such projectile charge to emerge from the gun in a free or unbound condition.

15 2. The herein-described art or method of determining and controlling the degree of spreading of a multimissile projectile charge, which consists in causing the gases of the powder charge to enter in determinate quantity into the projectile charge at or near the longitudinal axis of the gun while the projectile charge is passing through the bore of the gun, and permitting said charge to emerge from the muzzle of the gun in a free or unbound condition.

25 3. The herein-described art or method of controlling the flight of a multimissile projectile charge, which consists in interposing between the projectile charge and the powder or propelling charge a separating medium or body having a passage or opening whose axis is coincident with that of the barrel of the

gun and is of a diameter and length proportionate to the degree of spreading required; causing a portion of the gases of the propelling charge to traverse said passage and enter the projectile charge at or near its axis in quantity determined by the dimensions of the passage; and finally permitting the charge to escape from the muzzle of the gun in a free or unbound condition. 35 40

4. The herein-described art or method of effecting the spreading of a projectile charge composed of separate missiles, which consists in directing the gases incident to the explosion or burning of the propelling charge to or into the projectile charge at or near the center while the charge is still within the barrel of the gun but is otherwise free from wrapper or inclosing body. 45 50

5. The herein-described method of effecting and controlling the spreading or scattering of a multimissile projectile charge, which consists in causing a portion of the gases incident to combustion of the propelling charge to move inward toward the axis of the gun and to pass to or into the projectile charge at or near its axis while the projectile charge is moving through the barrel but is otherwise free from wrapping or inclosing body. 55

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Witnesses:

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