

A. C. STIMERS.  
Rifled Cannon.

No. 105,736.

Patented July 26, 1870.

FIG. 1

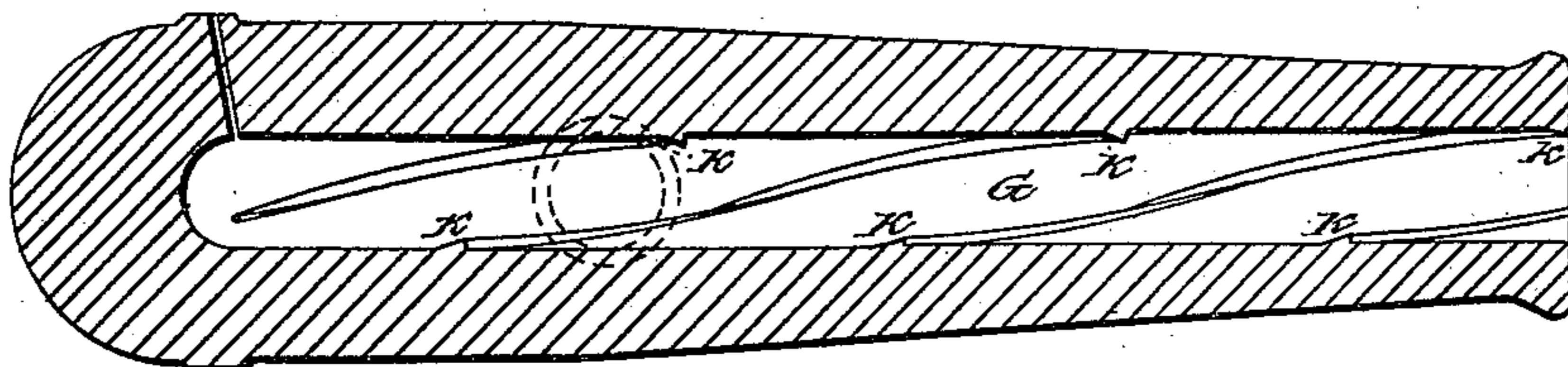


FIG. 3

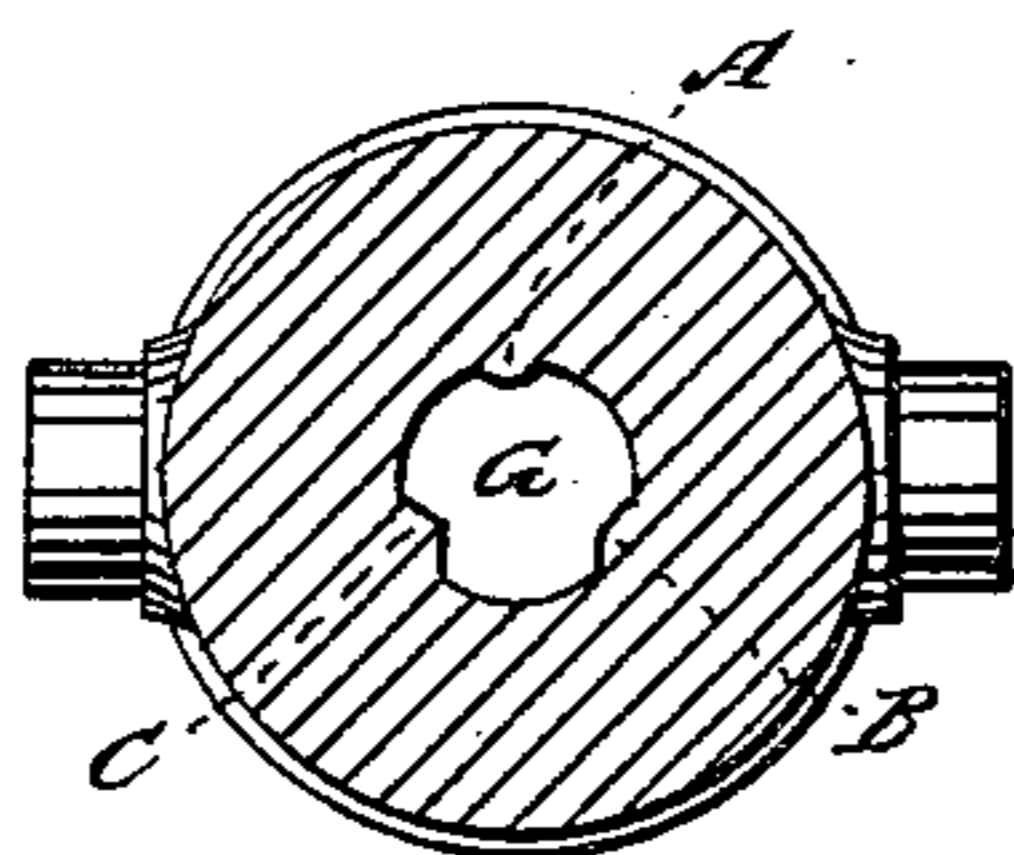


FIG. 2

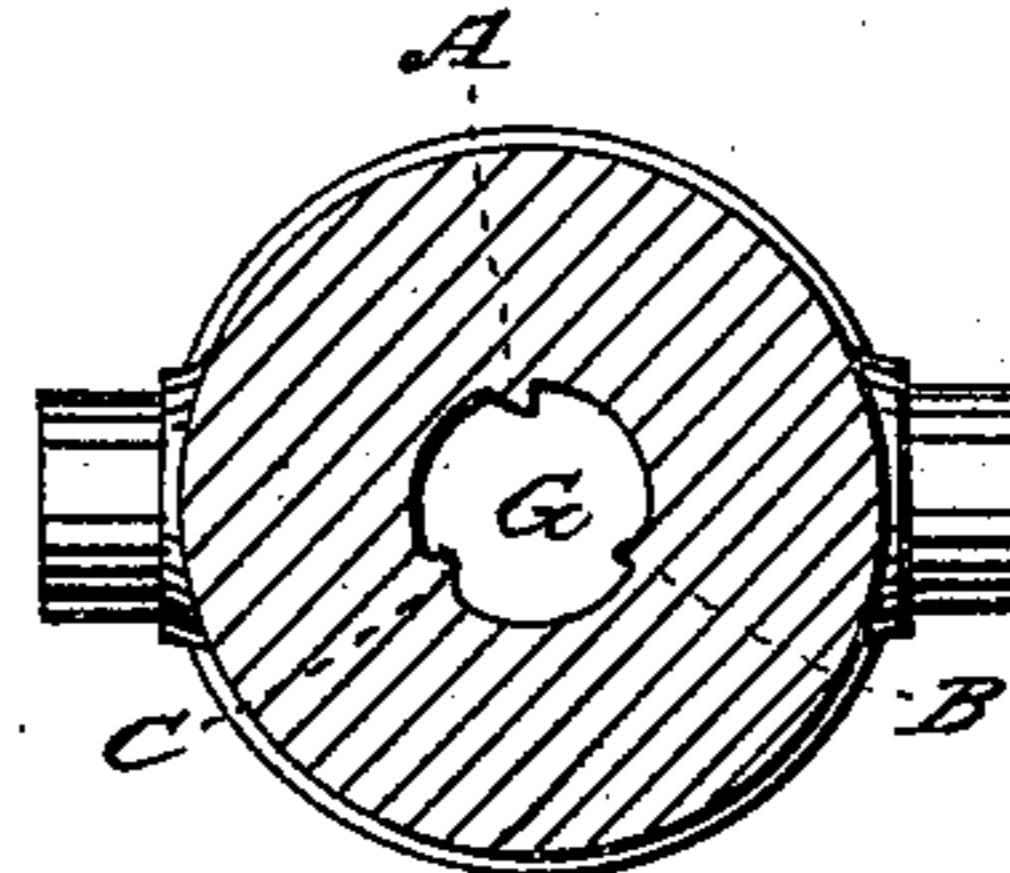
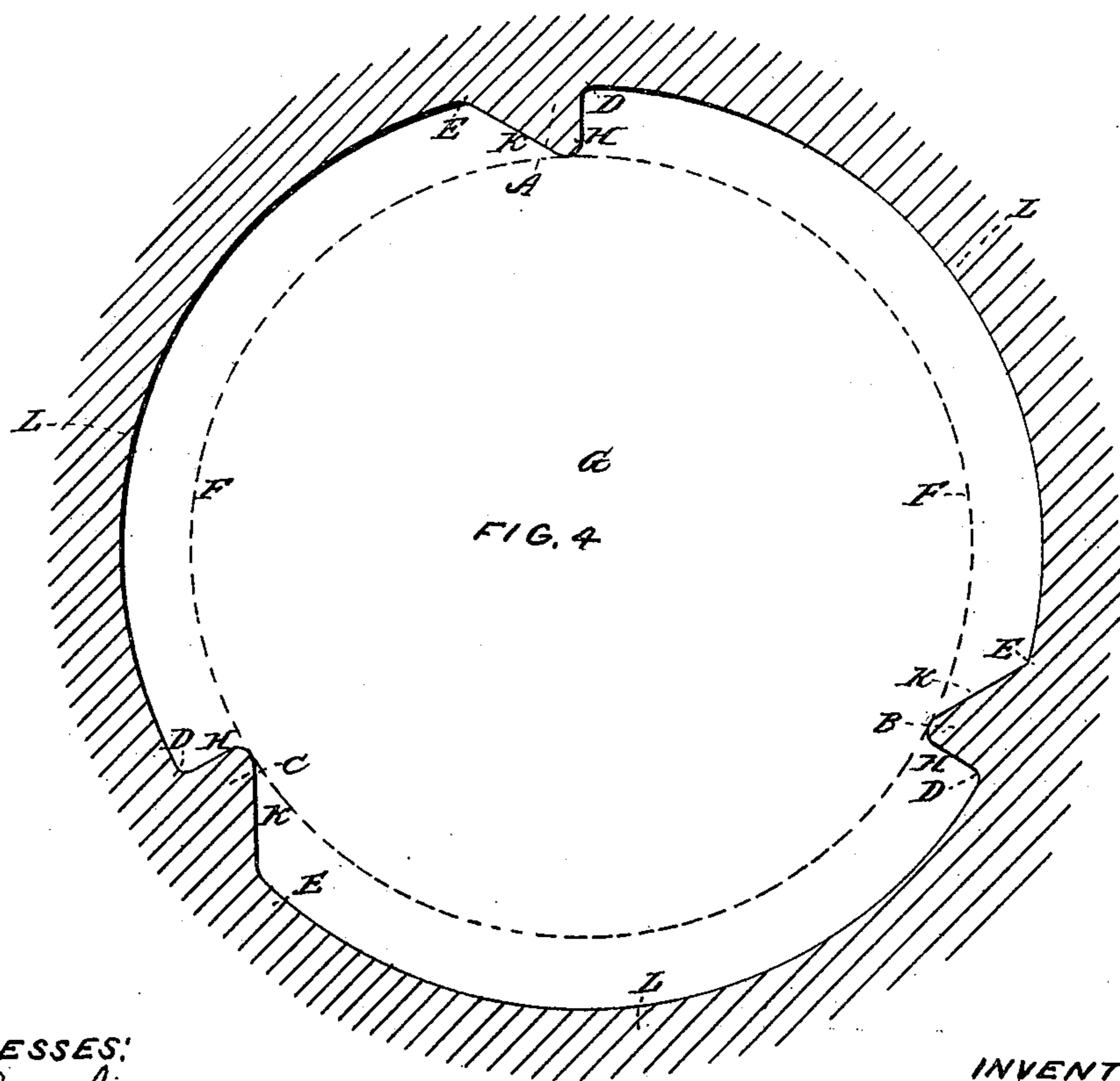


FIG. 4.



WITNESSES:

*George M. Colley*  
*Delapfield*

INVENTOR:

*Allan C. Stimers* By  
*Amos W. Rodman*  
*Atty.*

# United States Patent Office.

ALBAN C. STIMERS, OF CASTLETON, NEW YORK.

Letters Patent No. 105,736, dated July 26, 1870; antedated July 22, 1870.

## IMPROVEMENT IN RIFLED CANNON.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Know ye that I, ALBAN C. STIMERS, of the town of Castleton, county of Richmond and State of New York, have invented certain new and useful Improvements in Rifled Cannon; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the annexed drawing making part of this specification, in which—

Figures 1, 2, 3, and 4 represent, respectively, a vertical long section through the axis of a rifled cannon, a cross-section of the same, a cross-section with a permissible modification of the rifling, and an enlarged cross-section of the bore, showing the rifling more in detail.

Like letters refer to like parts in all the figures.

To enable others skilled in the art to which my invention appertains to make and use the same, I will proceed to describe its nature, construction, and application.

Guns are rifled with spiral grooves for the purpose of giving lateral revolution to the shot during its flight through the air, this being the only method yet brought into successful practice for preventing elongated shot from tumbling end over end.

It is well known to those familiar with ordnance that important advantages result from such peculiarities of shot and cannon as to cause the long axis of the shot to coincide with that of the gun during its passage through it when the cannon is fired, and from accomplishing this with iron or steel shot without the incumbrance of soft-metal attachments.

My improvements relate to lessening the weakening effects upon the cannon heretofore attending the achievement of the foregoing.

It is obvious that rifled cannon are the weakest outside of the deepest part of the rifling, because, as they are always made circular on the outside, the metal is thinnest at those parts, and because, the diameter of the bore measured across the riflings being greater than at other parts, the strain upon the thinner is greater than it is upon the thicker metal.

All who are familiar with the study of the strength of thick cylinders, such as hydraulic presses, guns, &c., understand that the outer portion of the cylinder assists in restraining the bursting tendency of the pressure within only by the expansion of the metal and the enlargement of the diameter of the inner portion.

In the smooth-bore cannon, this can occur in the most advantageous manner. The inner diameter being uniform throughout, an equal stress is brought upon all parts of the circumference of the bore, and, the metal having a uniform thickness, the circumferential extension and consequent radial enlargement are equally uniform throughout, while with the

rifled cannon, the diameter being greatest where the metal is the thinnest, there are as many interruptions to the degree of expansion, and consequent radial position of the particles composing the mass, as there are riflings; and in all the cannon heretofore rifled in such a manner as to center a shot formed to the riflings, the parts where the thickness of the metal is the least are so short in the circumferential direction that the rifled groove is like the notch which mechanics are in the habit of cutting in a bar preparatory to easily breaking it.

Now, my improvement consists in making the groove as wide as possible consonant with the ability to furnish an inclined surface of proper angle and extent to the shot at three points in the circumference, which shall compel the shot to revolve with its axis corresponding with that of the bore.

It will be observed, by reference to the drawing, that the form given in figs. 2 and 4 accomplishes this very fully.

The metal along E L D, fig. 4, is affected in the same manner as in the smooth-bore cannon, and at the junction with the thicker metal at D and E the increased length of the thinner and, when the pressure is applied, more expanded part over that obtained heretofore in this kind of rifled cannon gives it a greater ability to adjust itself to the different degrees of extension and radial enlargement which obtains with the thicker part, resulting in a stronger gun—the object of my invention.

In fig. 3 it will be observed that both edges of the rifling are inclined, instead of having one side radial, as in figs. 2 and 4. This mode will make the distance E L D less in any given cannon than when the rifling corresponds with figs. 2 and 4; but, on the other hand, the change from the thinnest to the thickest metal of the cannon is not as sudden, and this, of itself, is well known as a great advantage in favor of strength—perhaps more than sufficient to balance the weakening effect of narrowing the groove to the extent required to obtain this form.

To construct a cannon and embody my improvement, let the bore G be first bored to the dotted line F F, fig. 4; then let the grooves K L H be rifled out spirally in the ordinary manner, care being taken to give the bearing sides K such an angle with a tangent to the curve at E as to give revolution to the shot at the same time that it forces it to the center of the cannon. I prefer that this angle should be thirty degrees, but this may be varied.

From what has been written, the importance of making the bottom of the groove E L D, fig. 4, correspond with a correct circle struck from the center of the cannon will be appreciated as necessary to get the full benefit of this invention.

The sides of the groove K and H may be made straight, as shown by the drawing, or they may each be curved, so as to lessen the suddenness of the change from thin to thick metal.

In applying this invention, it is necessary to prepare the shot by mechanically cutting or casting grooves in the shot corresponding with the ribs, A B C, in the bore of the cannon.

What I claim as new and useful, and desire to secure by Letters Patent, is—

The within-described grooves in a rifled cannon, when their driving-edges are inclined sufficiently to center the projectile, and the concentric bottom of each groove has a greater circumferential extent than the radius of the bore, as and for the purpose specified.

ALBAN C. STIMERS.

Witnesses:

THEODORE ALLEN,  
EDWARD O'CONNOR.