

T. T. S. LAIDLEY.
PROJECTILE FOR RIFLED CANNON.

No. 17,935.

PATENTED AUG.

Fig. 2.

Fig. 1

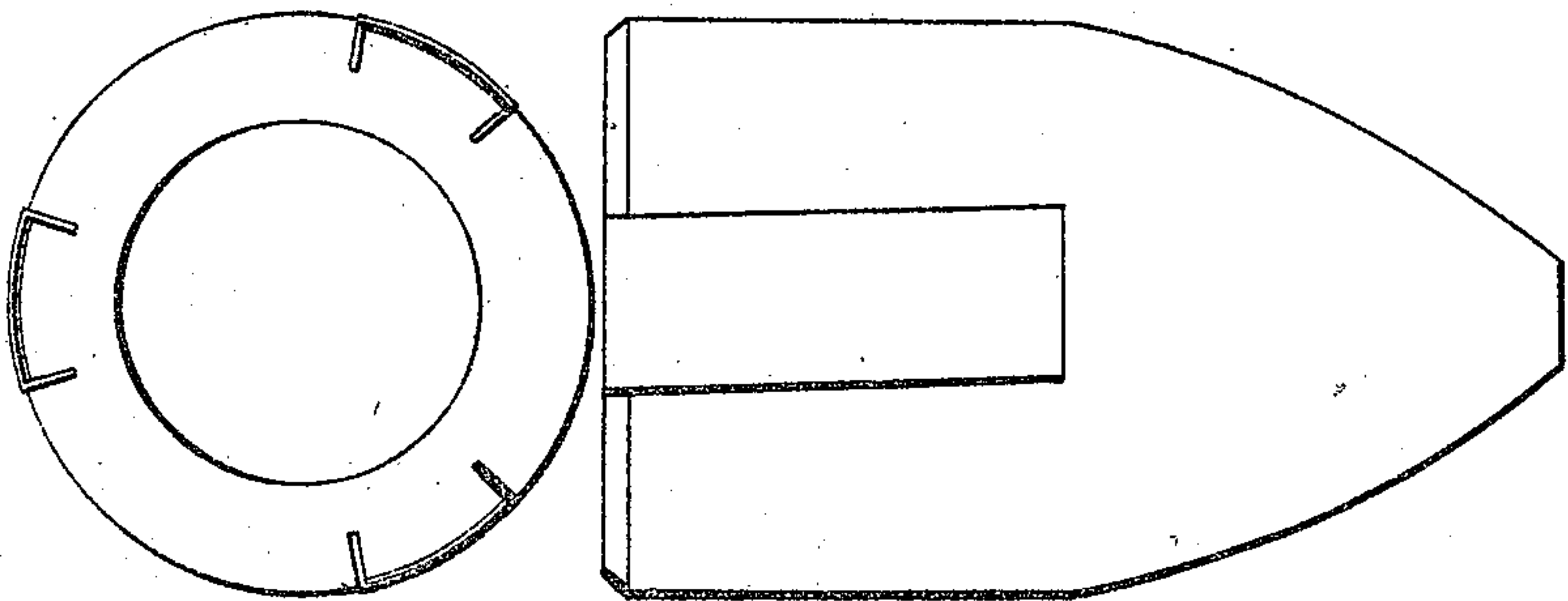


Fig. 4.

Fig. 3.

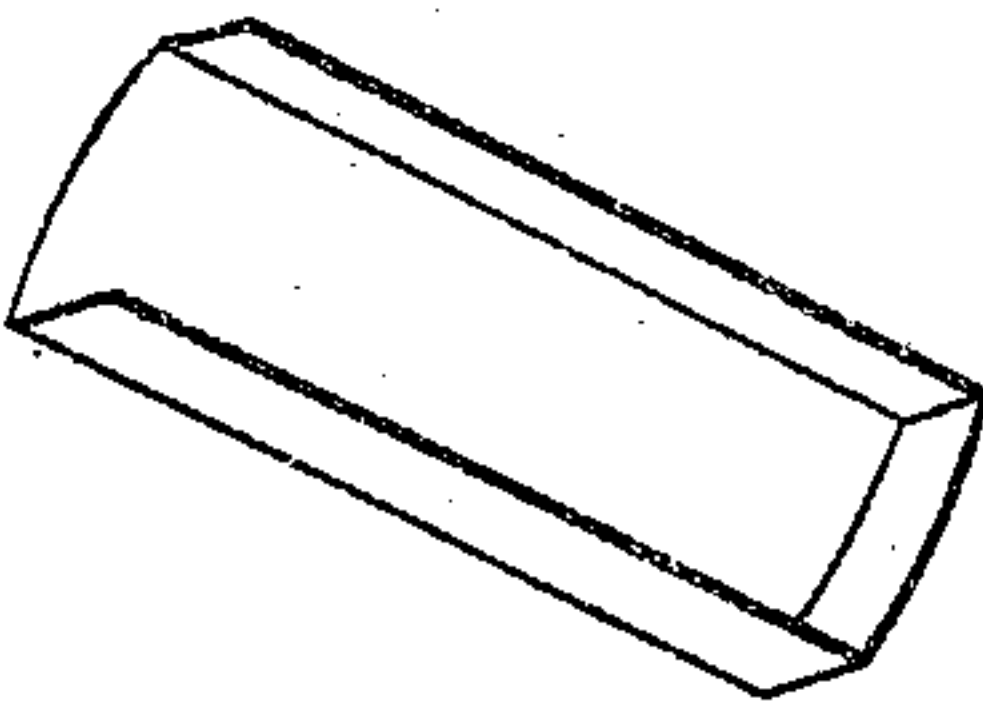
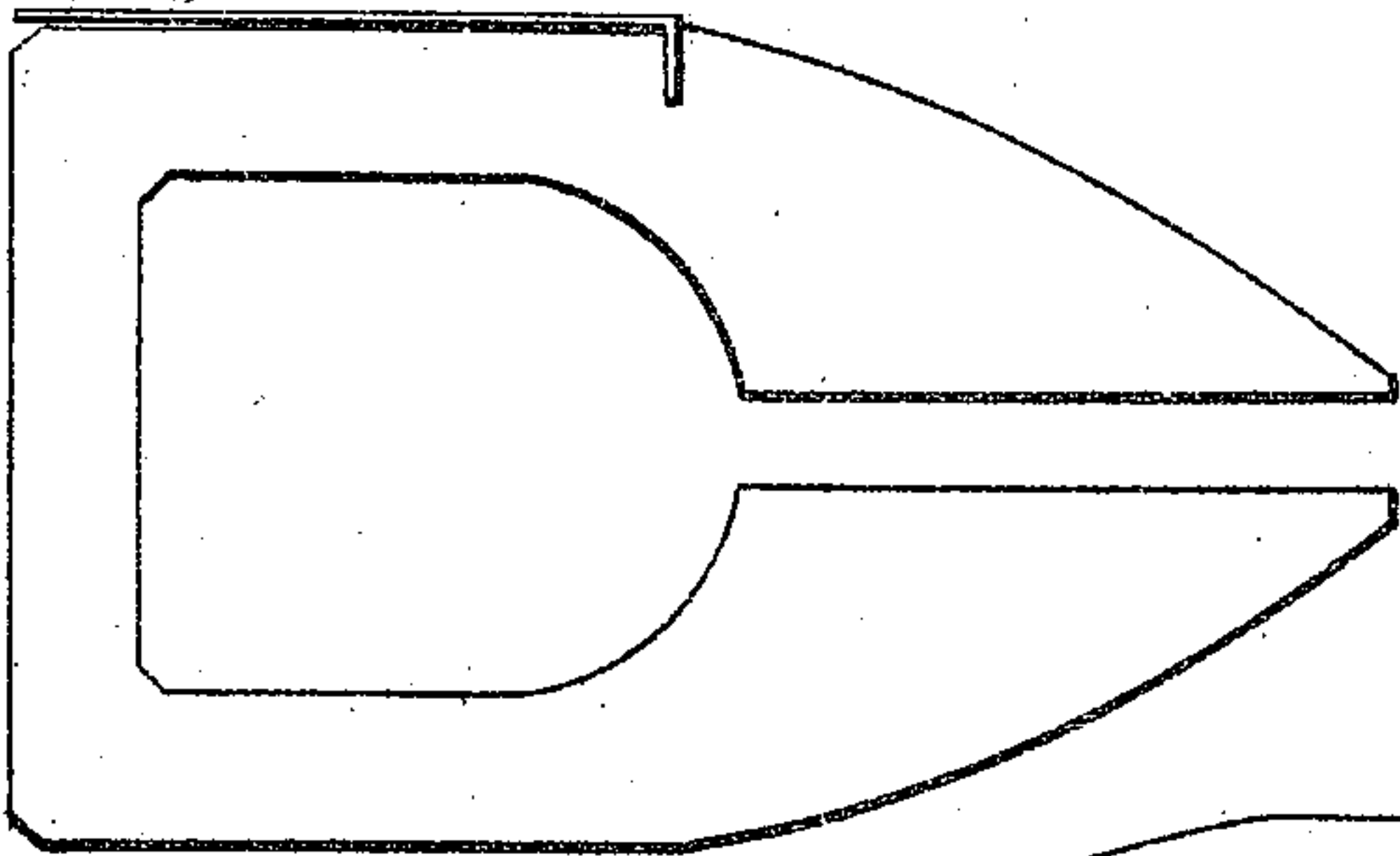


Fig. 5.

Fig. 6.

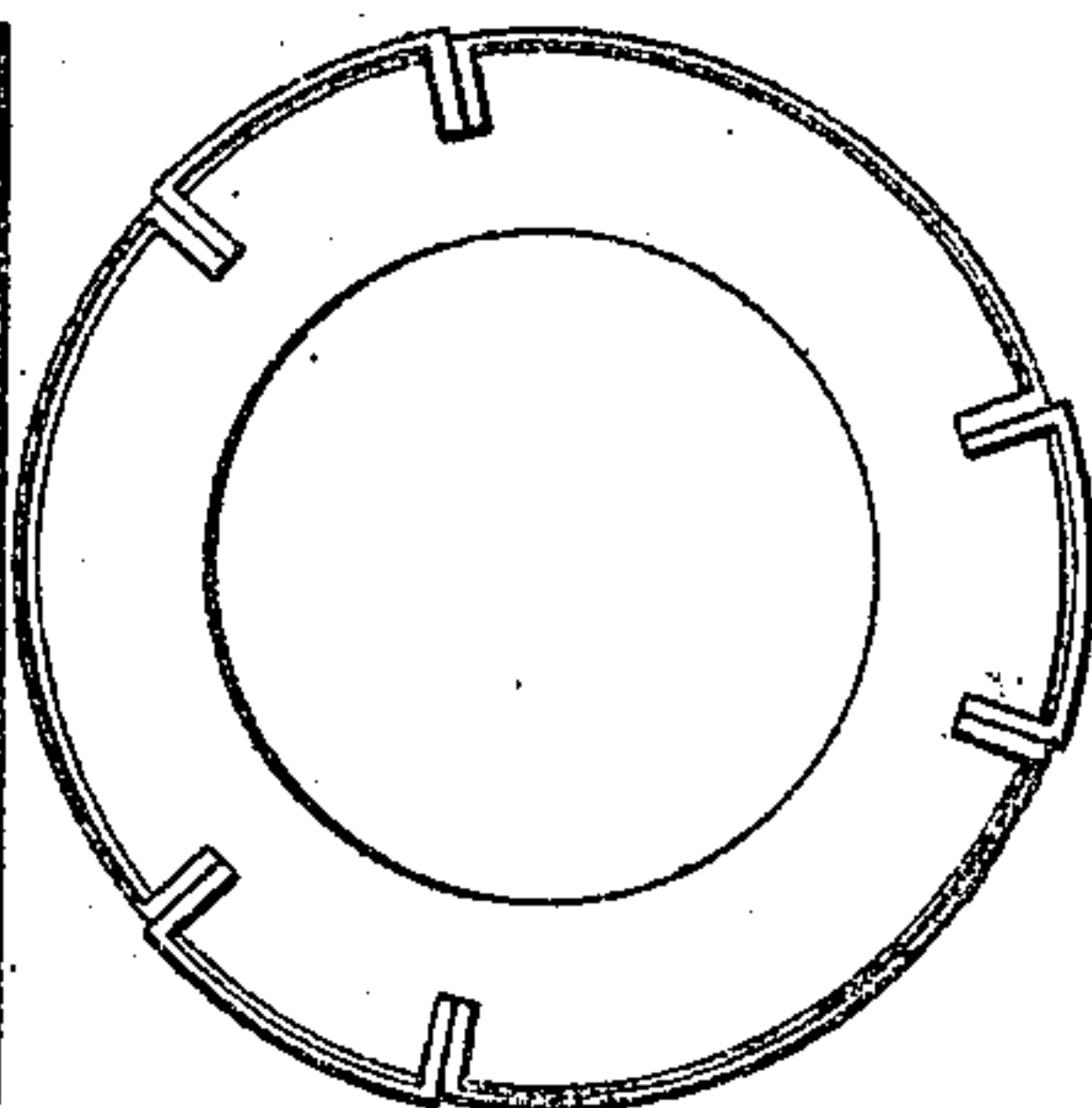
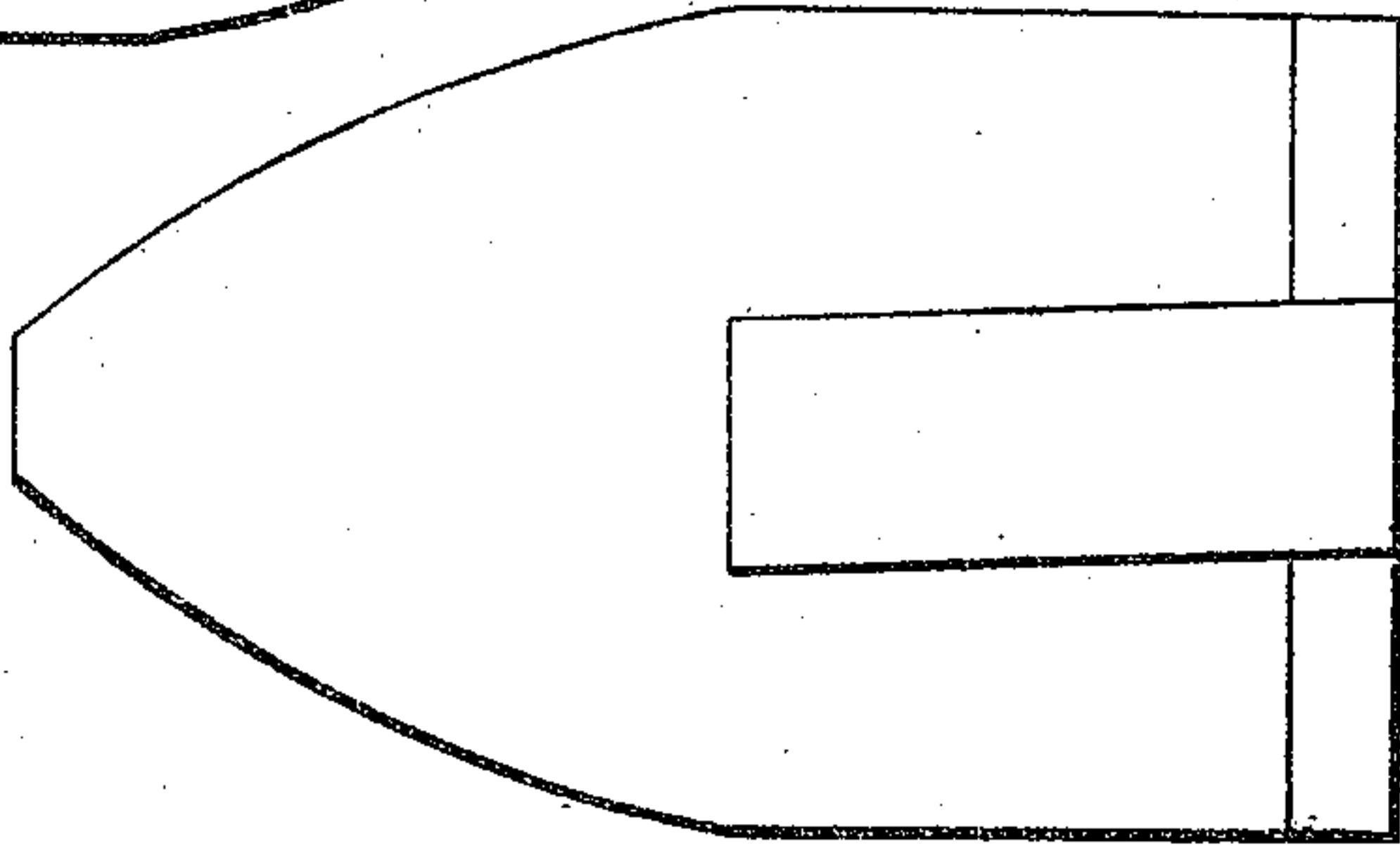
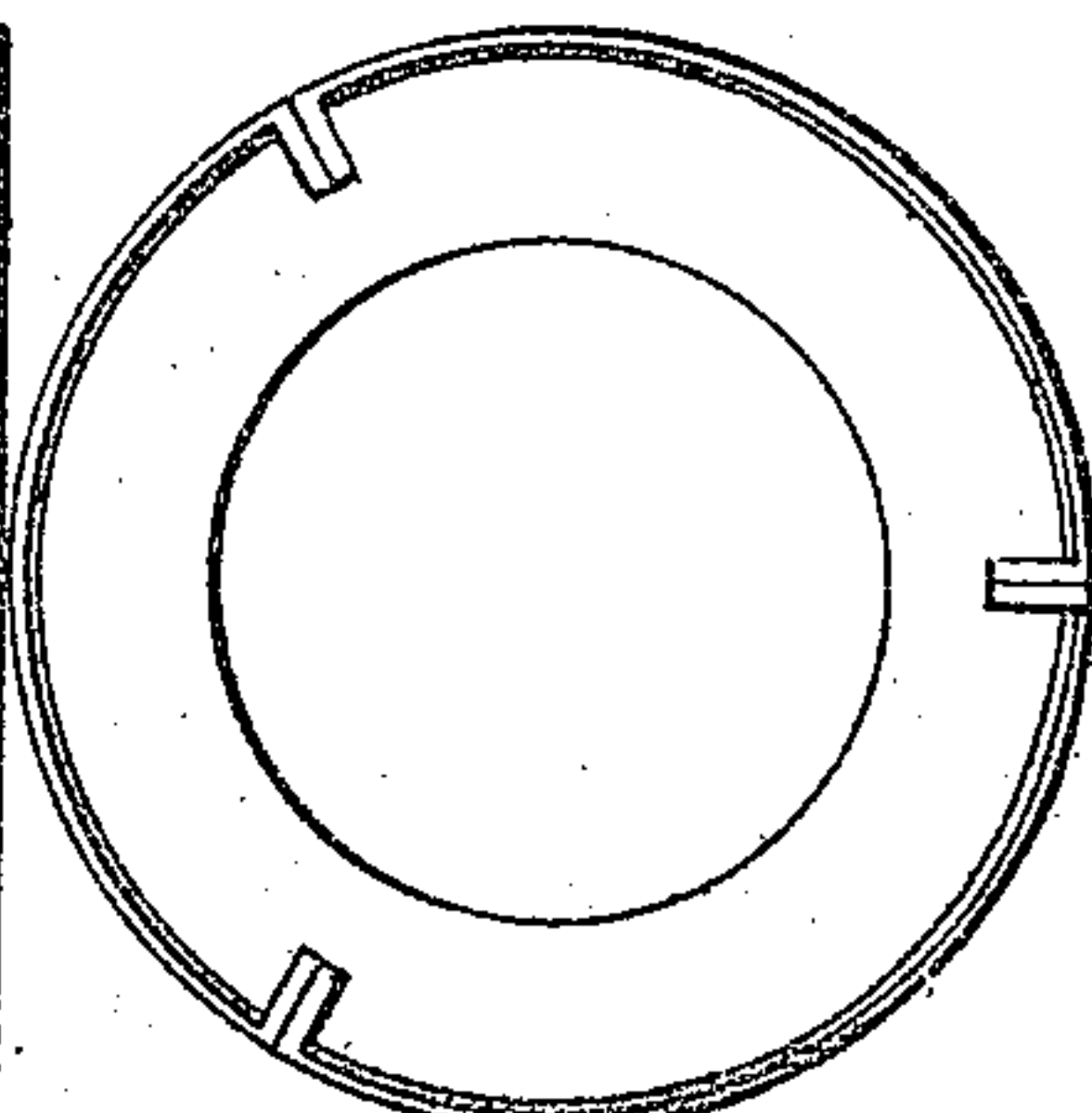
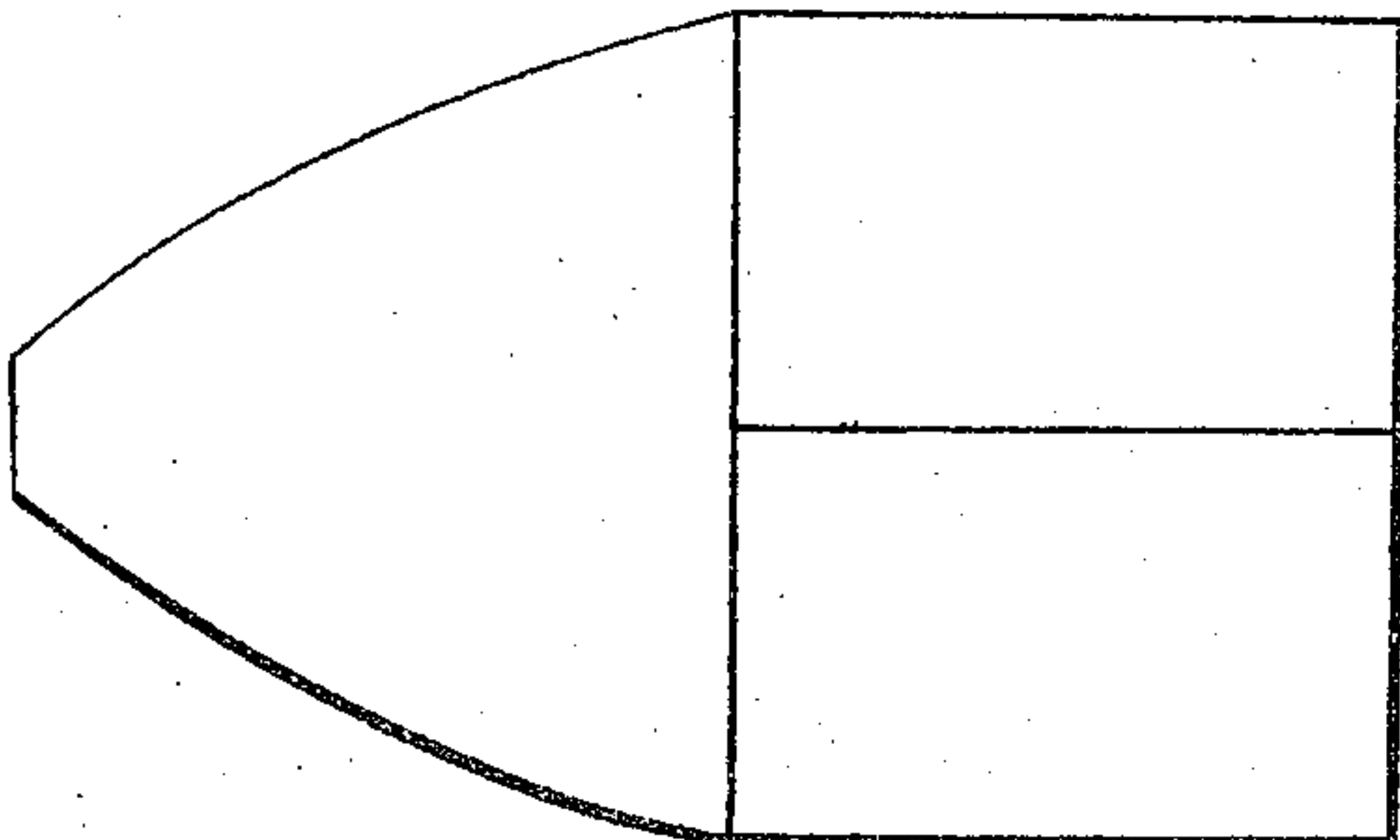


Fig. 7.

Fig. 8.



UNITED STATES PATENT OFFICE.

THEODORE T. S. LAIDLEY, OF THE UNITED STATES ARMY.

IMPROVED PROJECTILE FOR RIFLED CANNON.

Specification forming part of Letters Patent No. 17,925, dated August 4, 1857.

To all whom it may concern:

Be it known that I, THEODORE T. S. LAIDLEY, of the Army of the United States, have invented a new and Improved Projectile to be used from Rifled or Smooth-Bored Cannon; and that I do hereby declare that the following is a full and exact description thereof, with the manner of using the same.

My invention has for its object to increase the accuracy of fire in cannon by furnishing a projectile which shall be expanded by the action of the gases formed by the combustion of the charge and made to fit the bore of the gun closely, and in the rifled gun to fill the grooves and take up a rotary motion around its longer axis, and at the same time shall not fit so closely as to retard the operation of loading.

The nature of my invention consists in casting on the main body of the elongated shot, solid or hollow, two or more pockets, covering the whole or a part of the exterior surface of the shot or shell, a space being left between the main body of the shot and the inner surface of the pocket, these pockets being separate or joined together, and made of sheet iron or other malleable substance. The gases, entering the free space between the pocket and the cast-iron of the projectile, spread out the malleable material and cause the ball to fit closely and take the grooves in the rifled cannon.

Having thus described the chief characteristics of my invention, to enable any one skilled in the art to make and use my projectile, I will proceed to describe its construction and manner of using the same, making reference to the accompanying drawings, which make part of this specification, in which—

Figure 1 represents a plan of one of the forms of my projectile for rifled cannon, which has three pockets covering a portion only of the exterior cylindrical surface. Fig. 2 is a cross-section of the same perpendicular to the longer axis. Fig. 3 is a perspective view of one of the pockets, and Fig. 4 is a longitudinal section through the longer axis and one of the pockets.

The general form of the cast-iron shot may be the same as that of any of the various elongated bullets used for small-arms.

On the pattern for casting place three projections, corresponding in form, size, and po-

sition to the three pockets which are to be attached to the shot. They should be equidistant, and should project just as far as it is wished the pockets should.

The pockets may be made of sheet-iron, varying in thickness according to the weight of the shot, and may be bent or molded into shape by means of dies and punches or swages of the required form and size. They should be from one to two tenths of an inch less in width than the grooves, to permit the pockets to move in the grooves freely without danger of wedging or sticking fast. They should be long enough to form good bearings against the bore, to insure accuracy of fire. They should project so as to leave but little space from the pocket to the bottom of the grooves, lest in expanding too great a distance the pocket be ruptured or blown off. They should be placed on the shot, making the same angle with the longer axis that the grooves do with an element of the cylinder of the bore. The under surface of the pocket is covered with a coating of loam to prevent the cast-iron from coming in contact with that part, and to leave a free space for the passage of the gas into the pocket. They are secured in the recesses formed for them in the mold, and the liquid metal is poured. The pockets are thus firmly secured to the main body of the projectile by a cheap and easy process. They are little liable to be injured in handling, and, if deemed important, the ball may be heated red-hot for firing against shipping. The shot being cleaned and the opening into pocket being somewhat enlarged, to facilitate the passage of the gas after being gaged, is ready for use.

In firing this variety of my improved projectile, it is necessary to insert the shot into the bore in a particular position. The pockets must come opposite and enter into the grooves of the gun. When once so entered, the shot will slide home the same as any elongated ball. When the gun is discharged, the gases rush into the free space between the cast-iron and the pocket and expand the malleable material of which the pocket is made, causing it to press against the bottom of the grooves of the gun, and the three pockets thus become the bearings of the shot and the directrices of its motion, preventing the balloting of the ball, and likewise communicating to it a rotary motion around its longer axis, which renders the ex-

plosion of the hollow projectile at the moment of striking any resisting medium an easy matter.

In the shot thus described there is of course an escape of gas through the space intervening between the consecutive pockets. This may be prevented by adding three other pockets, as in Figs. 5 and 6, which represent a plan and cross-section of such a shot. The additional pockets are not required to be as long as the others, as their object is solely to stop the windage by their expansion and not to give direction to the shot, that being done sufficiently by the three others. By making them short the increased friction of longer pockets is avoided. They should be flush with the exterior surface of the shot and not project as the three long ones.

To avoid the insertion of the projectile into the bore of the gun in a particular position, the whole exterior surface of the cylindrical portion of the ball may be covered with two, three, or more pockets, the sides of one coming close up to the adjoining one. They may be formed of one piece or of several pieces brazed or soldered together or otherwise joined before being attached to the shot. Figs. 7 and 8 represent a plan and cross-section of such a shot. It may be fired from either a smooth-bored or rifled gun. The grooves of the latter in this instance should be the shallowest possible, and the windage of the shot should be as small as possible. In all cases the shot should be free from sand or dirt, and should be well oiled or greased, as well as the bore of the gun.

Other arrangements of the pockets might be made, and modifications of the pockets themselves might be easily suggested; but the foregoing are deemed sufficient to show the nature of my invention, as it is evident that such modifications or changes would not affect the principle or character of my invention as ex-

pressed above. The examples given are those which I deem most efficient, and which will work to best advantage when they come to stand the test of actual practice.

I do not claim, of course, the attachment of a malleable-iron tube to a cast-iron head, which tube, forming the body of the projectile, is expanded by the force of the discharge, so as to take the grooves of the rifled gun; neither do I claim the attachment to elongated shot or shells of a cylinder of wrought-iron fastened to the body of the shot or shell by having its bottom or sides more or less embedded in the cast metal of which the shot may be composed, the cylinder to be attached to the butt of the shot or shell and its sides projecting beyond; but

What I do claim as my invention, and as distinguished from all other things before known, and which I desire to secure by Letters Patent, is—

The attachment to the main body of an elongated projectile, either solid or hollow, of a covering of some malleable material composed of one or more pieces embracing the whole or a portion of the exterior surface, by embedding in the cast metal of the shot the turned-in end and two or more longitudinal seams or edges, so as to form on the cylindrical surface of the projectile two or more pockets having a free space between the cast metal of the shot and the malleable covering into which the gases, at the moment of discharge, entering, will force out the covering and cause it to fill the grooves of the rifled gun, and diminish or entirely cut off the windage of the projectile, whether fired from a rifled or smooth-bored cannon, substantially as above described.

THEODORE T. S. LAIDLEY.

Witnesses:

WILLIAM BELL,
ROBERT EDMUND CREASEY.