H. CSANYI.

ART OF PROJECTILE FIRING.

APPLICATION FILED JAN. 25, 1919.

1,358,296.

Patented Nov. 9, 1920.

2 SHEETS—SHEET 1.

Fig. 1.

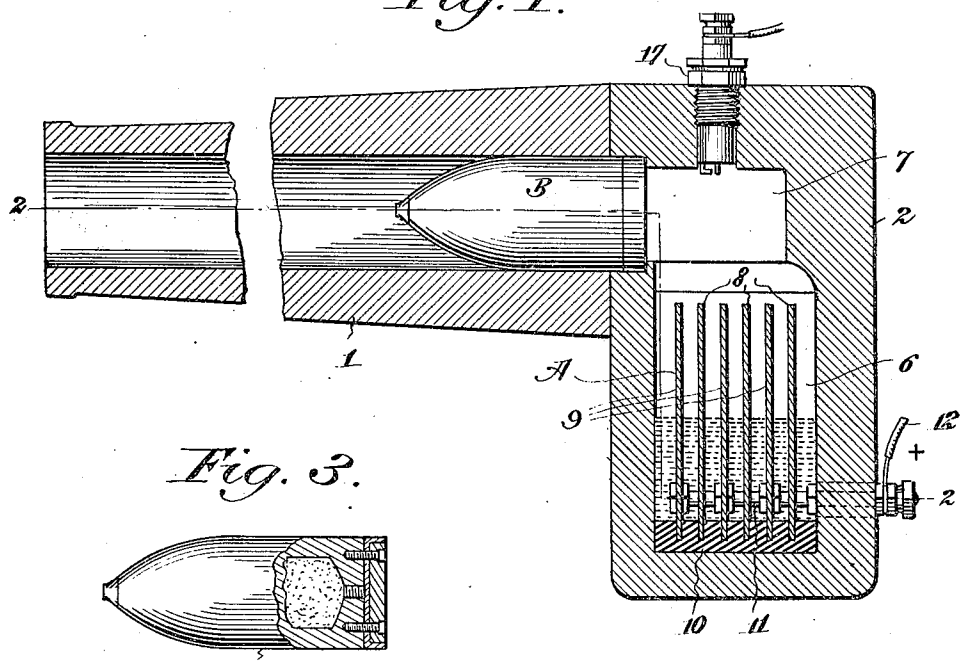
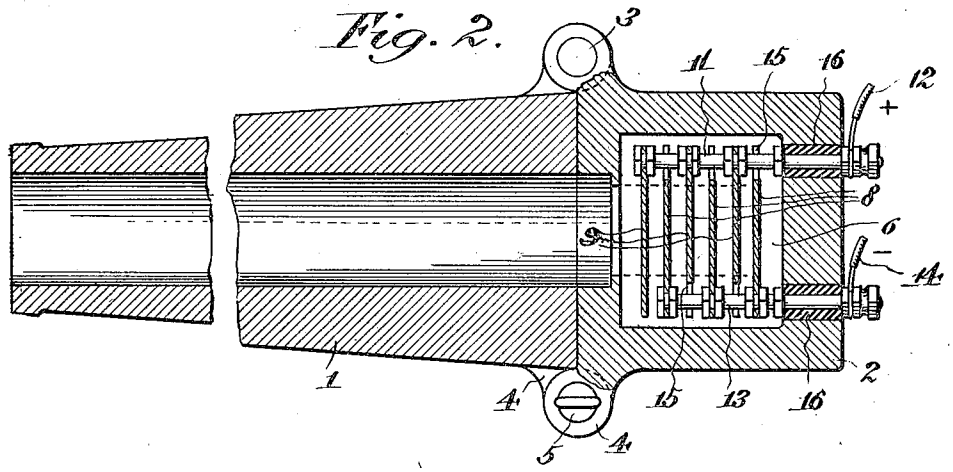


Fig. 3.

Fig. 2.



Inventor,

Henry Csanyi.

By his Attorneys,

Meyers, Cushman & Rea

H. CSANYI.

ART OF PROJECTILE FIRING.

APPLICATION FILED JAN. 25, 1919.

1,358,296.

Patented Nov. 9, 1920.

2 SHEETS—SHEET 2.

Fig. 4,

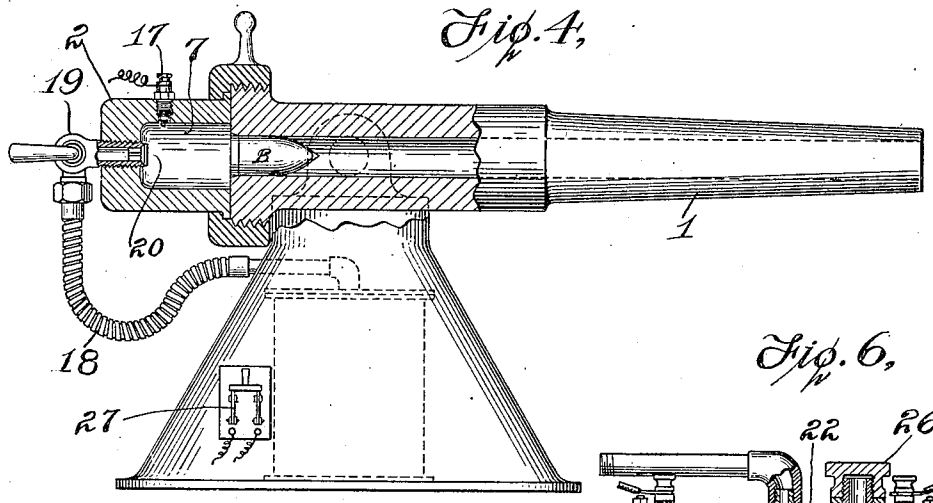


Fig. 6,

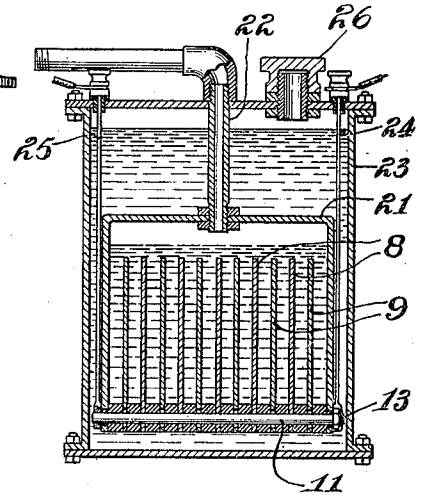
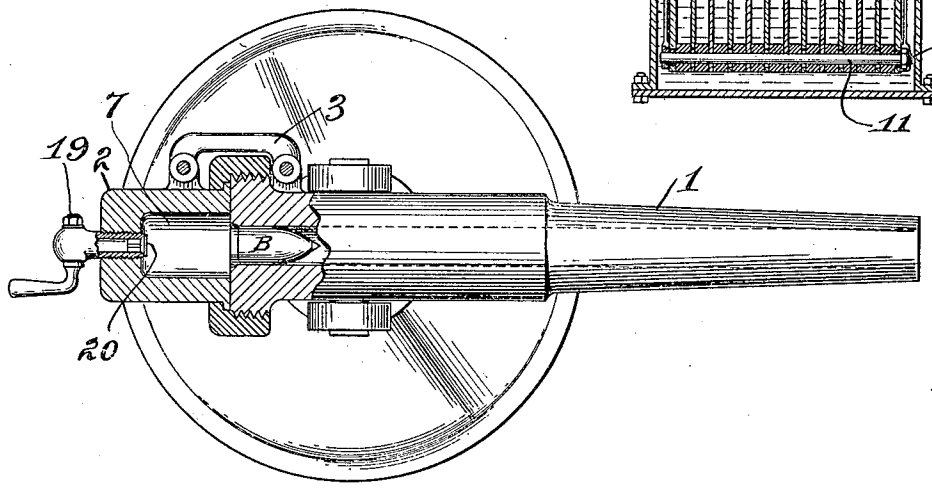


Fig. 5,



Inventor

Henry Csanyi

By his Attorneys

Meyers, Cushman & Rea

UNITED STATES PATENT OFFICE.

HENRY CSANYI, OF NEW YORK, N. Y.

ART OF PROJECTILE-FIRING.

1,358,296. Specification of Letters Patent. Patented Nov. 9, 1920.

Application filed January 25, 1919. Serial No. 273,201.

To all whom it may concern:

Be it known that I, HENRY CSANYI, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented new and useful Improvements in the Art of Projectile-Firing, of which the following is a specification.

This invention relates to projectile firing operations, pertaining more particularly to ordnance construction and the method of producing the discharging pressures in such operations, the invention being a continuation in part of that disclosed in application filed Sept. 20th, 1916, Ser. No. 121,191.

The present invention is designed to utilize the discharging pressures of combustible gases, such for instance as the component gases of salt or acidulated water, the latter being decomposed under the electrolytic action to produce the gases in a form usable for the purpose. In this manner the combustible gases may be generated in advance of use, admitted to a gas or charge-receiving chamber in rear of the projectile and then ignited to produce the discharging pressures.

The general invention may be carried out in various ways, a simple arrangement being to provide the breech-block—movable relative to the barrel, as by hinging—with a charge-receiving chamber in rear of the projectile, this chamber being adapted to communicate with a charge-generating chamber which may be attached to the breech-block or be formed independently of the latter and connected thereto by a suitable flexible connection. The charge-generating chamber carries the elements of an electrolytic cell, the electrodes being connected to a suitable source of electrical supply—as for instance a battery—which is made operative on the cell at will through a suitable switch structure. By making the cell active in the presence of salt water or acidulated water of suitable character, the decomposition of the water into its component gases is provided. These being led into the charge-receiving chamber with the breech-block closed,—and the charge ignited therein,—the projectile will be forced from the barrel.

The cell may be in open communication with the charge-receiving chamber, but it is preferred to provide a controllable port therebetween. Where the charge is generated for each discharge of a projectile, open communication may be had, the cell being inactive when firing takes place. It is preferred, however, to close communication at the time of firing, and it is also preferred to provide an arrangement by which the generation is more or less independent of the firing operations and in such case the structure may be arranged to accumulate gases and deliver the charge as needed, thus enabling increase in the rapidity of firing operations.

In either case, however, the charge is provided by the electrolytic action and in a separate chamber in order that the charge-receiving chamber may be maintained free from liquid.

To these and other ends, the nature of which will be understood as the invention is hereinafter disclosed, said invention consists in the improved methods and the combinations and constructions hereinafter fully described, illustrated in the accompanying drawings, and more particularly pointed out in the appended claims.

In the accompanying drawings, in which similar reference characters indicate similar parts,—

Figure 1 is a vertical sectional view taken through a simple form of construction.

Fig. 2 is a sectional view taken on line 2—2 of Fig. 1.

Fig. 3 is a view, partly in elevation and partly in section, of a projectile which may be employed.

Fig. 4 is a view, partly in elevation and partly in section, of another form of construction.

Fig. 5 is a view, partly in plan and partly in section of the arrangement of Fig. 4.

Fig. 6 is a sectional view of the charge-generating chamber of the structure shown in Fig. 4.

Referring to Figs. 1 and 2, 1 indicates the barrel and 2 the breech-block of an ordnance structure, the breech-block being shown as swingingly associated with the barrel, as at 3, to permit relative movement of the breech-block or barrel as may be preferred, these parts being locked together in suitable manner when the gun is being fired. A simple locking arrangement is by the use of an apertured lug or lugs 4 and a locking bolt 5.

As shown, the breech-block may be in the nature of a magazine having chambers 6 and

7, the former carrying the electrode structure, chamber 7 forming the charge-receiving chamber into which the gases are introduced.

The electrode elements—indicated collectively at A—are of opposite sign as indicated, electrodes of similar sign being arranged alternately with those of the opposite sign. For instance, 8 may indicate the cathodes or negative electrodes, and 9 the anodes or positive electrodes. These are shown as flat plates supported on an insulating base 10 which may be of fiber, hard rubber, etc. The electrodes are shown as extending vertically and in spaced parallelism—the spacing being dependent on the strength of the current employed—one set being in electrical connection with a connector 11 having a binding post connected to the conductor 12, the other set being connected electrically with a connector 13, also having a binding post connected to conductor 14. To prevent short-circuiting in cases where the plates have a width to extend over both connectors, plate connection to the circuit is limited to one connector by providing openings in the plate to permit passage of the other connector, the openings being of sufficient size to provide the insulating effect. Connectors 11 and 13 are insulated from the breech-block by suitable insulators 16.

The electrolyte, which is of a suitable acidulated water form, such for instance as salt water, is placed in chamber 6 thus surrounding the electrode system A therein. When the battery or other source of electrical supply is closed on to the electrode system, the electrolyte will be decomposed into its component gases, thus generating a combustible charge which enters chamber 7 and is more or less compressed therein by the action of the cell action. This gas may then be ignited in any suitable manner, as for instance by the use of a spark plug 17, the explosion serving to discharge the projectile, indicated at B, by the force of the explosion.

In the form shown in Figs. 4 to 6, chamber 7 is shown as connected to the cell by a flexible conne tion 18, said connection leading to a suitable plug valve 19 to control the connection, the outlet being controlled by a suitable valve, indicated as a check valve 20.

In this form the cell is shown as separated from the breech-block, and, as shown in Fig. 6, differs from the arrangement of Fig. 1 in that provision is made for an accumulation of gases. In this construction, the electrode system is shown as supported by an inverted bell 21—the mouth opening downward—supported on a tube 22 conne ted to the casing 23, said tube forming the outlet for the generated gases. The electrode system is of the type disclosed in Figs. 1 and 2, connectors 11 and 13 being supported by the bell and being connected to the respective binding posts by conductors 24 and 25. Casing 23 may have a filling opening 26.

As will be seen, the electrolyte is located both within and without the bell, the latter serving to isolate the decomposed gases from the portion of the chamber without the bell. As the bell is fixed in position, it will be understood that the generation of the gases within the bell produces a pressure therein which tends to drive the liquid outward into the outer chamber portion, thus in turn producing a compression action on any air that may be trapped therein, the mutual action tending to increase the pressure of the gases of the cell. By opening valve 19 the gases are introduced into the charge-receiving chamber under pressure which can be built up by the action of the cell, the valve closed, and the charge ignited, valve 20 preventing back pressure on valve 19.

Obviously, electrolytic action may continue while valve 19 is closed, by maintaining switch 27 closed.

As will be understood the invention may take on other forms without departing from the spirit and scope of the invention expressed in the accompanying claims, and I reserve the right to make such changes or modifications as may be found necessary or desirable in so far as is permitted by said claims when broadly construed.

What I claim is:

1. In ordnance construction, a gas gun comprising a gun barrel having a bore, a breech-structure therefor said structure being shiftable bodily to and from an operative position relative to the gun barrel to permit introduction of the projectile to said bore, and including a charge-receiving chamber located in the rear of the bore, a charge generating chamber adapted to be connected with the charge-receiving chamber, means operative within said charge generating chamber for producing electrolysis action therein in the presence of a fluid located within said chamber, the charge-receiving chamber being adapted to receive a charge consisting of the gas constituents of such fluid, a gas inlet connection which so controls the entrance of said charge of gas into said gas-receiving chamber that the latter may be maintained normally free from fluid contact until at or near firing time, and means operative in said charge-receiving chamber to ignite the charge.

2. In ordnance construction, a gas gun comprising a gun barrel having a bore, a breech-structure therefor said structure being shiftable bodily to and from an operative position relative to the gun barrel to permit introduction of the projectile to said bore, and including a charge-receiving chamber locted in the rear of the bore, a charge-

generating chamber adapted to be connected with the charge-receiving chamber, means operative within said charge-generating chamber for producing electrolysis action therein in the presence of a fluid located within said chamber the charge-receiving chamber being adapted to receive a charge consisting of the gas constituents of such fluid, a gas inlet connection which so controls the entrance of said charge of gas into said gas-receiving chamber that the latter may be maintained normally free from fluid contact until at or near firing time, means operative in said charge-receiving chamber to ignite the charge and means for prohibiting any back firing through the gas inlet connection.

3. In ordnance construction, a gas gun comprising a gun barrel having a bore, a breech-structure therefor said structure being shiftable bodily to and from an operative position relative to the gun barrel to permit introduction of the projectile to said bore, and including a charge-receiving chamber located in the rear of the bore, a charge-generating chamber adapted to be connected with the charge-receiving chamber, means operative within said charge-generating chamber for producing electrolysis action therein in the presence of a fluid located within said chamber, the charge receiving chamber being adapted to receive a charge consisting of the gas constituents of such fluid, a gas inlet connection which so controls the entrance of said charge of gas into said gas receiving chamber that the latter may be maintained normally free from fluid contact until at or near firing time, an igniter carried by the breech-structure to explode the charge and means for prohibiting any back firing through the gas inlet connection.

4. In ordnance construction, a gas gun comprising a gun barrel having a bore, a breech-structure therefor said structure being shiftable bodily to and from an operative position relative to the gun barrel to permit introduction of the projectile to said bore, and including a charge-receiving chamber located in the rear of the bore, a charge generating chamber adapted to be connected with the charge-receiving chamber, means operative within said charge generating chamber for producing electrolysis action therein in the presence of a fluid located within said chamber the charge-receiving chamber being adapted to receive a charge consisting of the gas constituents of such fluid, a gas inlet connection which so controls the entrance of said charge of gas into said gas receiving chamber that the latter may be maintained normally free from fluid contact until at or near the firing time, an electric igniter carried by the breech-structure, a battery for operating said igniter to explode the charge, and means for prohibiting any back firing through the gas inlet connection.

5. In ordnance construction, a gas gun comprising a gun barrel having a bore, a breech-structure therefor said structure being shiftable bodily to and from an operative position relative to the gun barrel to permit introduction of the projectile to said bore, and including a charge-receiving chamber located in the rear of the bore, a charge generating chamber adapted to be connected with the charge receiving chamber, means operative within said charge generating chamber for producing electrolysis action therein in the presence of a fluid located within said chamber, the charge-receiving chamber being adapted to receive a charge consisting of the gas constituents of such fluid, means for preventing the harmful admixture of the gases other than in the charge-receiving chamber, an electric igniter carried by the breech structure, a battery for operating said igniter to explode the charge and means for prohibiting any back firing through the gas inlet connection.

In testimony whereof I have hereunto set my hand.

HENRY CSANYI.