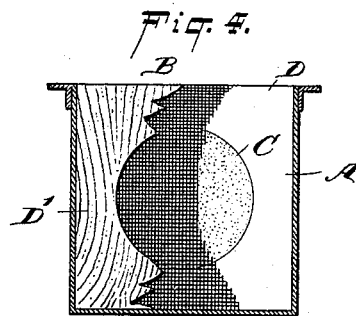
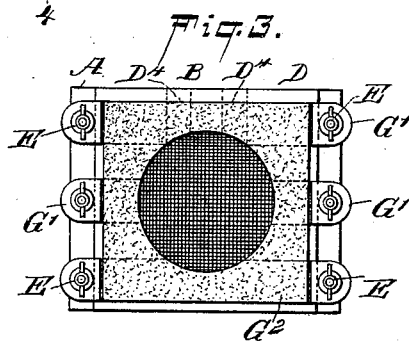
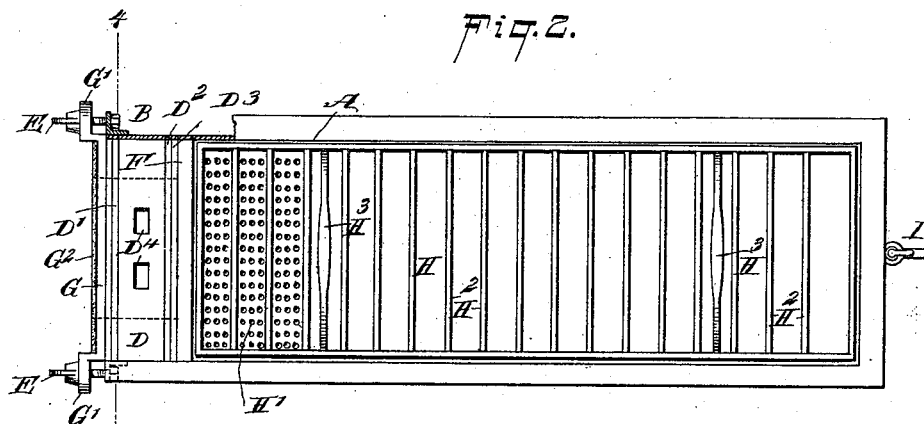
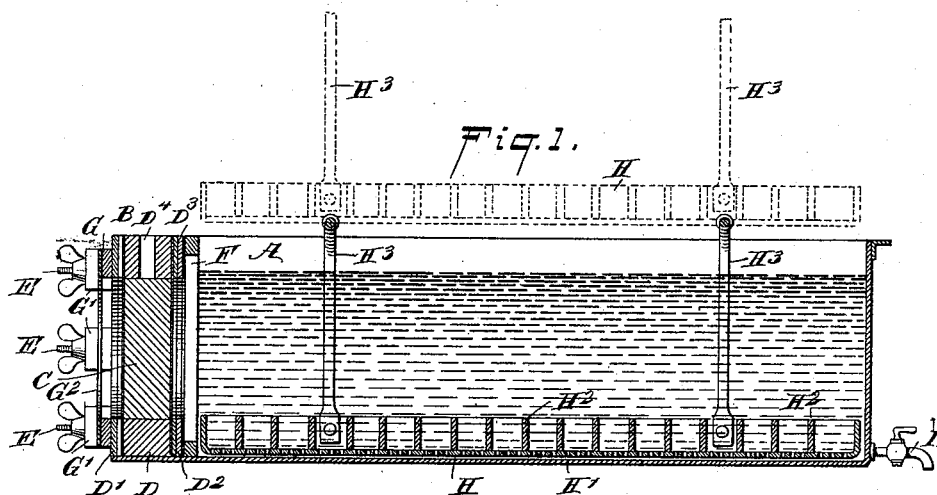


(No Model.)

H. BRUNSWIG.
MEANS FOR MEASURING THE PENETRATIVE FORCE OF PROJECTILES.
No. 523,510.

Patented July 24, 1894.



WITNESSES:

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UNITED STATES PATENT OFFICE.

HEINRICH BRUNSWIG, OF TROISDORF, GERMANY.

MEANS FOR MEASURING THE PENETRATIVE FORCE OF PROJECTILES.

SPECIFICATION forming part of Letters Patent No. 523,510, dated July 24, 1894.

Application filed January 9, 1894. Serial No. 496,227. (No model.) Patented in Germany July 7, 1893, No. 74,296; in England July 13, 1893, No. 13,609, and in Belgium July 18, 1893, No. 105,591.

To all whom it may concern:

Be it known that I, HEINRICH BRUNSWIG, a subject of the Emperor of Germany, at present residing at Troisdorf, near Cologne, Rhenish Prussia, Germany, have invented certain new and useful Improvements in Means for Measuring the Penetrative Force of Projectiles, (for which I have obtained Letters Patent in Great Britain, No. 13,609, dated July 13, 1893; in Belgium, No. 105,591, dated July 18, 1893; in Germany, No. 74,296, dated July 7, 1893, the patent being in the name of "The Rheinisch - Westfaelische Sprengstoff - Act. Ges.," of which the following is a full, clear, and exact description.

The object of the invention is to provide a new and improved apparatus for accurately measuring the penetrative force of projectiles, in a very simple and convenient manner. The apparatus consists of a tank adapted to contain water, and having a head formed of a jelly or another soft glutinous substance, and serving to retain the water within the tank, at the same time permitting the projectile to readily pass through it and into the water in the tank.

The invention also consists of certain parts and details and combinations of the same, as will be fully described hereinafter and then pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a sectional side elevation of the improvement. Fig. 2 is a plan view of the same with parts in section. Fig. 3 is a front elevation of the improvement; and Fig. 4 is a transverse section of the same on the line 4—4 of Fig. 2.

The tank, A, is adapted to contain a body of water which offers resistance to projectiles fired through the head, B, forming one end of said tank. This head B is provided with a jelly or other glutinous substance C, contained in a frame D adapted to be fastened by bolts E to the end of the tank A, the said frame D being provided on its opposite faces with wooden strips D' and D², of which the latter is faced with rubber D³ adapted to be

seated on a seat F secured to the end of the tank A, so that a water-tight joint is formed between the head B and the said tank A.

In order to securely hold the several parts of the head in position, I provide a protection disk G, carrying cross bars G' engaged by the bolts E previously mentioned. In this disk G is arranged a circular opening through which the shot or projectile passes to engage and pass through the jelly C previous to entering the tank A, and the said disk is provided with a felt facing G².

In order to place the jelly in the frame B, I cover the front and rear faces thereof with a fine fabric, and in the top cross bar of the said frame D form openings D⁴ through which the jelly in a fluid state is poured, to fill the inside of the frame, and when hardened, forms with the frame D, a complete head. It is understood that the glutinous substance is dissolved in water heated to the necessary temperature, and the solution is poured into the wooden frame D and left therein for the mass to cool and harden.

I do not limit myself to any particular substance for making the jelly, as various substances may be used, such, for instance, as Chinese gelatine, agar-agar, fish and other glue, &c.

Within the tank A is placed a tray H having a perforated bottom H' and transverse partitions H² forming compartments in which the projectiles drop after their force has been overcome by the resistance of the water in the tank A. The tray H is provided with handles H³ adapted to be taken hold of by the operator to lift the tray out of the water and out of the tank A, so as to reach the projectile in the respective compartment of the tray.

It is understood that in lifting the tray out of the water, the latter drains back into the tank through the perforated bottom H'. On the end of the tank A opposite the head B is arranged a faucet I, for drawing off the water from the tank whenever desired.

It will be seen that the penetrative force of the projectile can be readily calculated by its location in a corresponding compartment in the tray H, as the farther away from the head B a projectile drops into a compartment, the

more penetrative force it has, compared with a projectile dropped into a compartment near the head B.

5 It will be seen that by the construction described the projectile can readily pass through the soft jelly into the tank, and at the same time the said jelly prevents the water from leaving the tank before the shot is fired into the tank.

10 It will further be seen that in case a charge of shot passes through the jelly part of the head B into the tank A, it can be readily determined how many shots are located in the several compartments formed in the tray H, 15 so as to determine the result of a charge.

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

1. An apparatus of the class described, provided with a tank adapted to contain water 20 and having a head formed of a sheet of jelly

or other glutinous substance, to retain the water in the tank and to permit the projectile to readily pass through it and into the water in the tank, substantially as shown and described. 25

2. An apparatus of the class described, provided with a tank adapted to contain water and having a head formed of a sheet of jelly or other glutinous substance, to retain the 30 water in the tank and to permit the projectile to readily pass through it and into the water in the tank, and a tray arranged in the said tank and provided with compartments, substantially as shown and described. 35

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

HEINRICH BRUNSWIG.

Witnesses:

OTTO DAHLMANN,
FRITZ SCHRÖDER.