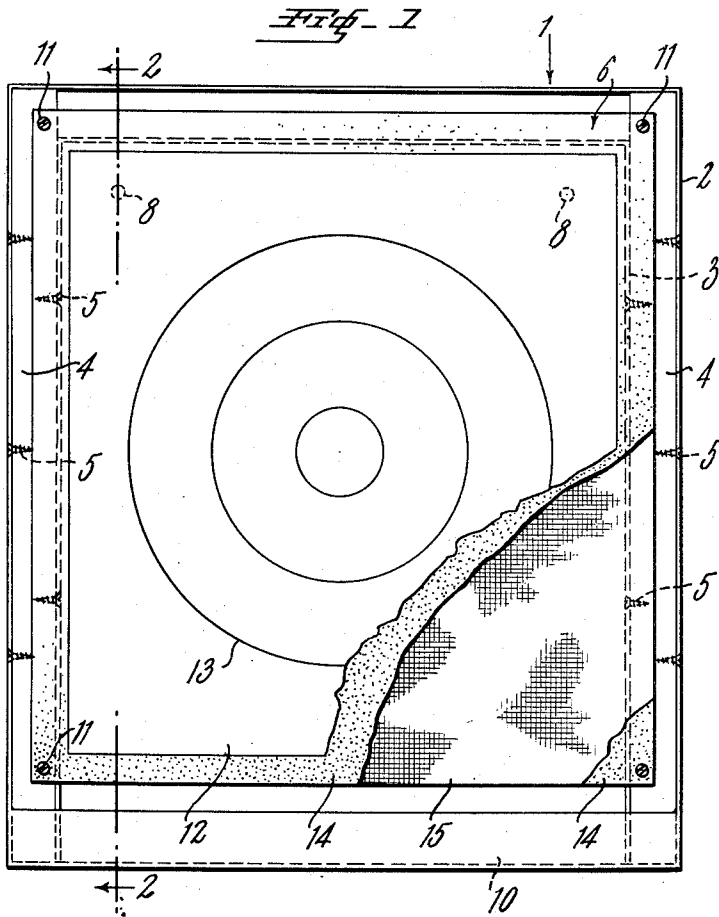
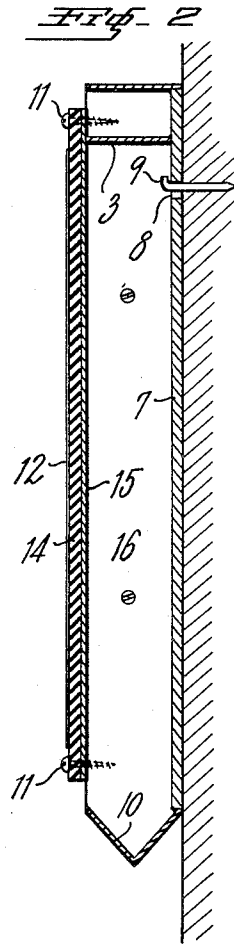
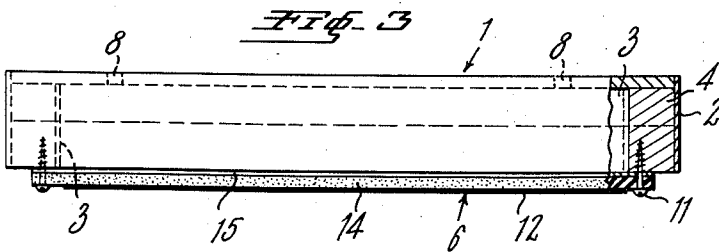


Dec. 26, 1950

R. D. GARTRELL
SELF-SEALING RIFLE TARGET

2,535,280

Filed Nov. 8, 1946



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2,535,280

SELF-SEALING RIFLE TARGET

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Application November 8, 1946, Serial No. 708,732

2 Claims. (Cl. 273-102.4)

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My invention relates to targets and more particularly to targets suitable for use in practice matches with small caliber rifles or pistols.

It is an object of my invention to provide a new and improved target of the type described having means to stop and trap the bullets fired during a match.

It is another object of my invention to provide a target so constructed and arranged as to eliminate the hazard of deflected or ricocheting bullets.

A further object of my invention is the provision of a target which is capable of being punctured by bullets a large number of times without substantial damage so that the target has an exceptionally long life.

In the accompanying drawing:

Fig. 1 illustrates a target constructed in accordance with my invention with a portion of the target broken away;

Fig. 2 is a sectional view through the target taken along the line 2-2 of Fig. 1 and showing the interior thereof; and

Fig. 3 is an end view of the target.

Referring to the drawing, my target 1 includes an outer rectangular framework of metal 2 within which is nested a second metal frame 3 the two frames being fastened to wood strips 4 in any suitable manner, as by means of the screws 5. The assembly of steel frames and wood strips form, in effect, a hollow box or housing. The front of the box is closed by a rubber diaphragm or sheet 6 of a construction and for a purpose to be described later. The rear face of the box is closed by a steel plate 7 secured to the frame 2 and which serves as a back stop or impact plate for bullets puncturing the target diaphragm 6. Openings 8 are formed in the back plate 7 to provide means for supporting the target on a wall, as by means of hangers 9. The lower wall of the outer frame 2 is formed in the shape of a V, as indicated at 10, in Fig. 2, so that it serves as a trough into which the spent bullets drop. The diaphragm 6 is fastened to the wooden strips 4 by means of screws 11 located in the four corners of the diagram. However, it should be manifest that any suitable means may be used to secure the diaphragm to the wooden strips and which will permit easy removal of the diaphragm for replacement.

When using the target, a temporary paper sheet 12 having a target pattern 13 is placed over the diaphragm 6 and is held in position in any suitable manner. Thus the diaphragm 6 forms a backing for the target sheet 12 and is so de-

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signed as to withstand puncturing by a large number of bullets whereas it is customary to replace the target sheet 12 at frequent intervals in a shooting match.

The diaphragm 6 is constructed of a relatively heavy sheet of soft vulcanized rubber 14. It is resilient so that it tends to reseal itself after a bullet has passed therethrough. This self-sealing action takes place due to the adhesive action between the particles of rubber and to the resiliency of the rubber in stretching to let the bullet through. Also, it is flexible so that it is deflected and stretched somewhat under bullet impact. I have found that a suitable diaphragm may be constructed of rubber having a Shore-A durometer hardness of 50. Manifestly, the rubber used may be natural or any one of the various synthetic compounds available.

A diaphragm such as described operates satisfactorily as a support for the target sheet 12 in that it will absorb a large number of shots without tearing or breaking. However, since there is a tendency for the diaphragm to stretch when a bullet hits, there may be some slight tearing of the paper target sheet 12 at that time. To overcome this difficulty, I provide the diaphragm with a fabric reinforcing sheet 15. I prefer to use a fabric made of synthetic thread such as nylon although fabrics of glass, cotton, or rayon, or the like, have also been found suitable. The fabric backing acts as an integral part of the diaphragm and controls or limits the stretching of the rubber layer 14.

Since the diaphragm 6 is spaced from the impact plate 7, the target is provided, in effect, with a chamber 16 which collects the spent bullets where they drop into the trough 10. When a bullet penetrates the diaphragm 6 and strikes the back plate 7 it is prevented from bouncing or being deflected out of the target housing by the action of the diaphragm 6. In other words, if a bullet glances off the back plate 7, the diaphragm is sufficiently strong and resilient to prevent the bullet from again penetrating the diaphragm. The bullet falls harmlessly into the trough 10. In this way the hazards of ricocheting bullets to any contestant or spectator are eliminated.

Although a bullet easily punctures the diaphragm 6, its action is to offer a certain amount of resistance to the bullet because as it deflects under impact it absorbs a considerable amount of the energy of the bullet. This means that the force of the bullet is somewhat spent as it hits the impact plate 7 which makes it possible to reduce the thickness of the plate.

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In constructing the target, the diaphragm should be spaced a sufficient distance from the impact plate 7 so that the bullet does not deflect it to a point adjacent the back plate. In such cases there would be some likelihood that the diaphragm would be scored or cut by fragments of bullets which spatter when they hit the steel backing plate. As an example of a target suitable for use with 22 caliber rifles or pistols I construct the housing with dimensions of approximately 14" x 14"; the impact plate 7 is made of $\frac{1}{4}$ " steel and the diaphragm or rubber approximately $\frac{1}{4}$ " thick; the diaphragm is spaced from the steel plate by approximately 2". However, it should be manifest that the target may be designed for use with higher caliber fire arms by increasing the strength of the component parts.

My target is one which has an exceptionally long life due to the self-sealing action of the rubber diaphragm 6. In actual tests it has been found that a 4" x 4" area of the diaphragm shows no sign of failure after having been pierced by 500 bullets of 22 caliber. The target is simple in construction and light in weight so that it is particularly well suited for use with small bore fire arms such as are used in rifle or pistol matches.

Having thus described my invention, what I claim and desire to protect by Letters Patent is:

1. A target including a flexible, resilient self-sealing rubber diaphragm which itself seals an opening formed by passage of a bullet therethrough, said diaphragm being of such thickness that it is deflectable under impact of a bullet to absorb the kinetic energy thereof so that a

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bullet passing therethrough becomes substantially spent, said diaphragm having a fabric backing to limit the deflection thereof, and an impact plate spaced from said diaphragm a distance greater than the normal deflection of the diaphragm upon being struck by a bullet, said resilient diaphragm preventing return passage therethrough of spent bullets which have been deflected from said impact plate.

2. In a target, a flexible, resilient, self-sealing rubber diaphragm, said diaphragm itself sealing an opening formed by passage of a bullet therethrough and being of such thickness that it is deflectable under impact of a bullet to absorb the kinetic energy thereof so that a bullet passing therethrough becomes substantially spent, said diaphragm having a fabric backing to limit the deflection thereof.

ROBERT D. GARTRELL.

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