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SEARCH ROOM

May 14, 1968 O. J. DUNDR 3,382,821

STALLS FOR SHOOTING RANGES

Filed Sept. 3, 1965 3 Sheets-Sheet 1

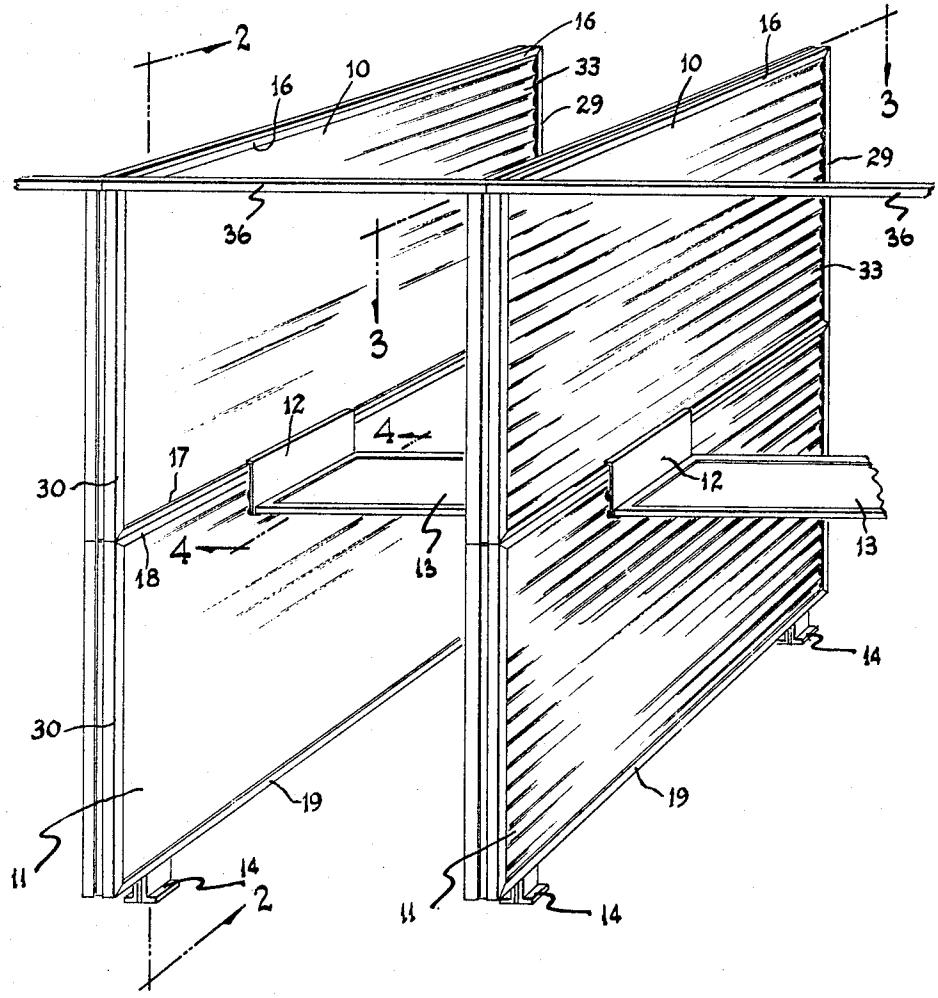


Fig. 1

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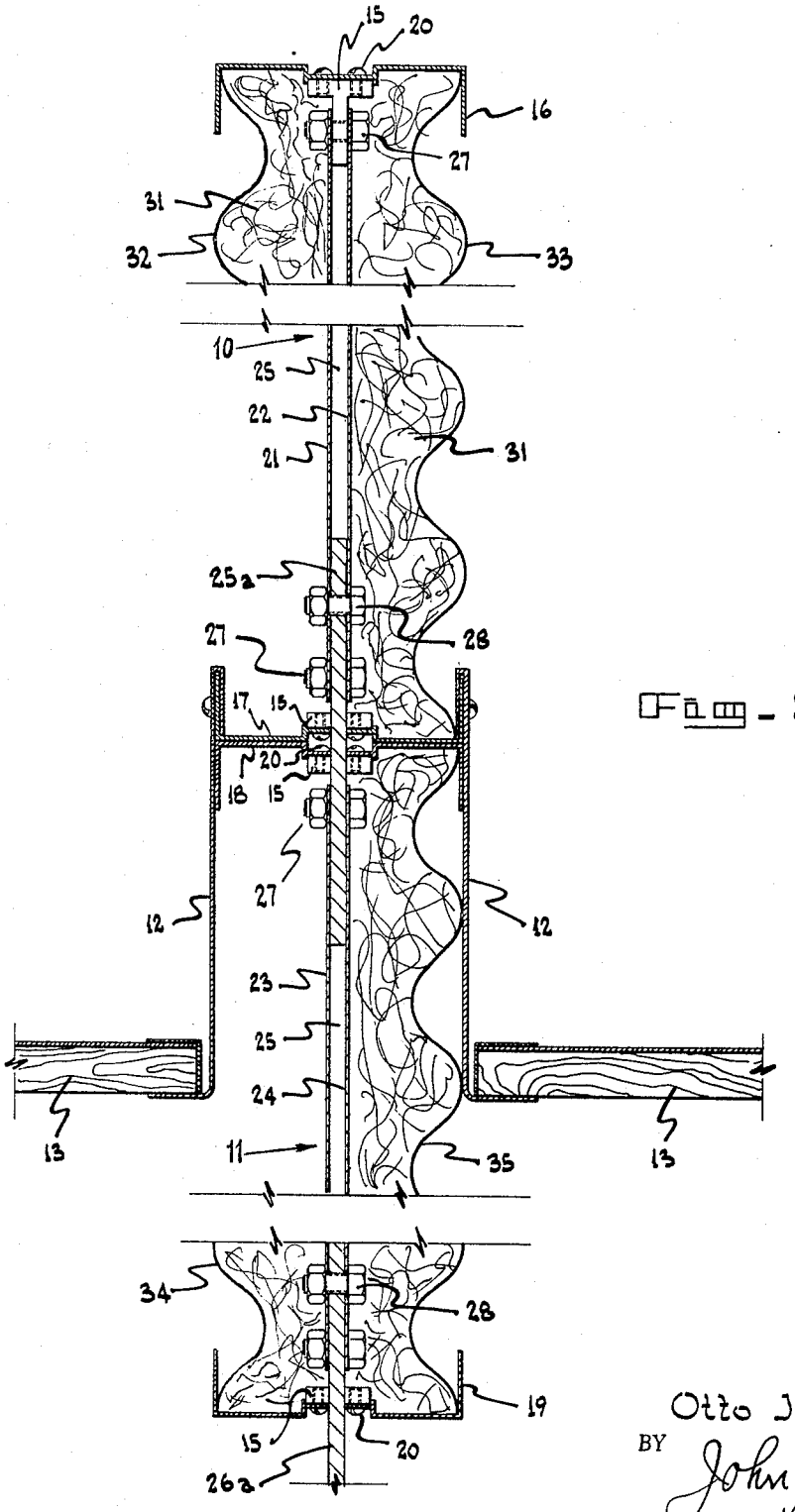


Fig. 2

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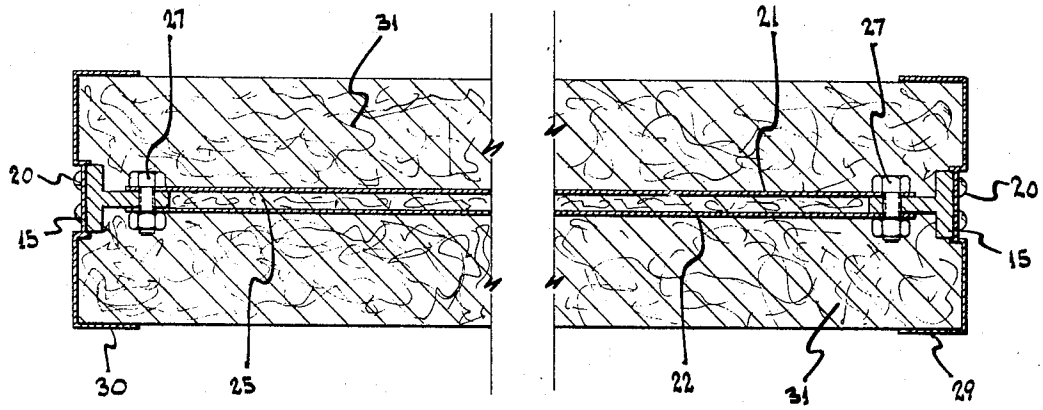


Fig. 3

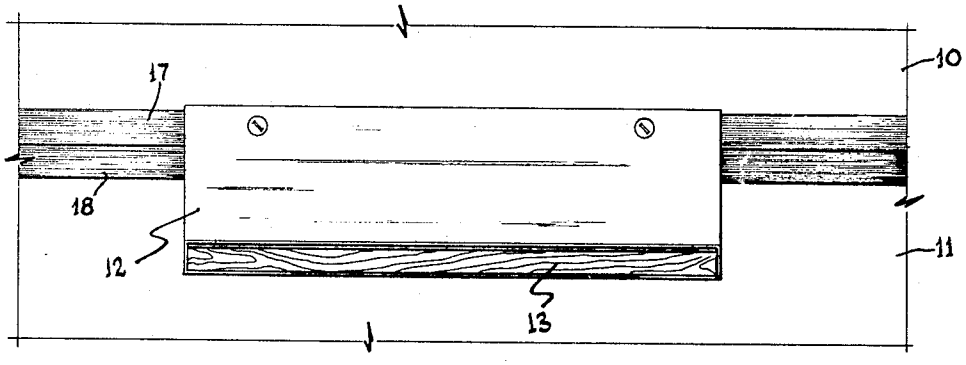


Fig. 4

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STALLS FOR SHOOTING RANGES

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8 Claims. (Cl. 109—82)

ABSTRACT OF THE DISCLOSURE

A protective stall for shooting ranges wherein a pair of spaced generally vertical walls are mounted in interconnected frames, each of the walls including an outer metal panel and an inner metal plate with a body of fibrous material therebetween.

This invention is directed to shooting stalls for firearm training and recreational target shooting ranges which are normally installed in suitable enclosures.

Objects of my invention are:

(a) To provide shooting stalls adapted to be economically erected and having vertically extending multiple spaced apart walls providing a shooting chamber and in which each of said separating vertical walls comprise at least two spaced apart corrugated metal walls mounted within a suitable metal frame and having mounted between the same a pair of spaced apart metal armor plates having separating spacers therebetween, and having suitable fiber insulation between said corrugated outer walls and said armor plates; said corrugated walls being of a thickness adapted to permit penetration of missile or bullet fragments.

(b) To provide easily erectable and easily cleanable shooting stalls as recited in the preceding paragraph and having removable and adjustable shooting benches mounted between each pair of multiple walls and means for adjustably mounting the same and which have means for removing the same to permit users to take other positions, as desired.

(c) To provide one or a plurality of protective shooting stalls or compartments having vertical dividing side walls with outer metal sound arresting characteristics and which provides protection of occupants from accidental wild shots of occupants of other stalls; which have inner acoustical insulation material and inner spaced apart penetration resistant metal plates, panels or walls which will top usual bullets from passing therethrough, and which have frame means for mounting two or more of said walls in horizontally spaced part positions.

(d) To provide multiple side walls for shooting stalls of multiple construction having outer metal walls which are preferably corrugated and adapted to be penetrated by bullets; a plurality of spaced apart metal plates or panels which slow down the speed of bullets striking the same, and in which each panel spreads a bullet to larger sizes so that the bullet is finally too large to ricochet out of the entering hole; and also fibrous insulation between said plates and said outer metal walls which absorb sound and impede the transmission of sound waves, and frame and support means for holding said multiple walls in desired spaced apart positions.

Other and further important objects of my invention will be apparent from the following specification and claims.

On the drawings:

FIG. 1 is a perspective view of one of my shooting stalls, and having a fragment of an adjacent bench and a fragment of an upper connecting truss connected thereto.

FIG. 2 is a cross section thereof taken on a vertical plane indicated by line 2—2 of FIG. 1.

FIG. 3 is an enlarged cross section, with parts broken away, on a horizontal plane indicated by line 3—3 of FIG. 1.

FIG. 4 is an enlarged cross section taken on a line indicated by line 4—4 of FIG. 1.

Numerals **10** and **11** generally designate two vertical extending multiple outer walls or wall sections which are preferably of multiple construction, including spaced apart corrugated metal sheets, as described, and which are mounted in superposed position, one above the other, with the lower edge of upper section **10** superposed and connected to the upper edge of wall section **11**. Each shooting stall has two multiple spaced apart parallel walls, each wall having two of the aforesaid connected wall sections **10** and **11**.

As shown in FIG. 2, a plurality of horizontal metal bars **15** of T-shaped cross section are secured by a plurality of screws **20** to channel-like metal frame members **16, 17, 18** and **19**. Similar T-shaped bars **15** are secured by screws **20** to vertical frame members **29** and **30** as shown in FIG. 3.

A fiber spacer or filling **25** flanked and enclosed by a pair of armor plates or metal panels **21** and **22** which plates are secured by bolts **27** to the inner legs of the T-shaped bars **15**, as shown in FIG. 2. The vertical edge portions of said armor plates **21** and **22** are also secured by bolts **27** to the inner legs of the vertical T-shaped bars **15**, as shown in FIG. 3. It is to be noted that a similar construction and connection exists in the lower portion of lower wall section **11**, as illustrated in FIG. 3.

The intermediate frame member **17** has a plurality of longitudinally spaced apart slots to permit the entry and engagement of a plurality of metal plates or tongues **25***a*, as shown in FIG. 2. The said plates **25***a* are secured by bolts **28** to the armor plates **21** and **22** which extend through holes formed therein, as shown in FIG. 2. Lower frame member **19** also has a plurality of slots formed therein to permit entry and engagement of metal plates or tongues **26***a*, which said plates **26***a* are secured by bolts **28** to lower opposed armor plates **23** and **24**. A pair of angular brackets or supports **14** have their upper portions suitably secured to the lower edges of tongues **26***a* as shown in FIG. 1, and these hold each of the multiple walls substantially above the floor, as shown in FIG. 1.

It shall be noted that the upper wall portion **10** and lower wall portion **11** are interchangeable. The tongues or plates **25***a* and **26***a* serve the dual purpose of joining and mating the two wall portions **10** and **11** and provide a useful support or anchoring device conveniently securable to the floor by utilizing the supporting brackets **14**. This provides an accessible space above the floor which can be kept clean and free of shells and bullet fragments.

Each upper partition or upper multiple wall unit or section has two corrugated metal panels **32** and **33** in superposed positions and each lower wall section **11** has two corrugated metal panels **34** and **35** mounted respectively on opposite sides of the metal armor plates **21, 22, 23** and **24**, as illustrated in FIG. 1 and FIG. 2. Fiberglas insulation **31** is pressed into the spaces between each pair of these corrugated panels, as shown in FIG. 2.

While in FIG. 1 we illustrate one shooting stall and fragments of an adjacent panel and a connecting bar, it is to be understood that a plurality of the desired number of stalls may be built in adjacent position in shooting range enclosures. Where two or more stalls are built in adjacent positions, each multiple wall as described, other than the two walls at the end of a series, will be an intermediate dividing wall between each pair of adjacent stalls, and opposite walls of such dividing walls will perform the described functions and protection characteristics for the two stalls adjacent to it.

In building and installing a series of stalls, the upper rear corner portions of section **10** are suitably connected

by an elongated horizontal connecting bar **36** which is secured at spaced apart points by bolts or screws (not shown) or by welding to the upper portions of said dividing walls, as illustrated in FIG. 1. Said connecting bar **36** rigidifies said dividing walls and maintains same in substantially vertical planes.

Referring to FIG. 2 and FIG. 4, it will be noted that the upwardly and horizontally extending integral edge flanges of the intermediate frame member **17** provide rigid hook-like means, on which the upper backwardly turned hooks of metal angular brackets **12** are suspended. Brackets **12** are made of relatively wide sheet metal and with their lower ends extending at right angles normally away from the adjacent corrugated panels and into the compartment or stall. Suitable panels or counters **13** of rectangular form are removably secured horizontally on said brackets **12** for convenient use of the person using each stall. Said counters can be removed for prone shooting or for access to the range or target area.

An additional important accomplishment of our construction is that each person is guarded and protected from mis-fired shots of persons in adjacent booths; and from bullet fragments which ricochet from wild shots. The outer corrugated metal surfaces are adapted to be penetrated by bullet fragments, some of which embed and stop in the fibrous insulation material, and some of which may pass through the insulation material and be fully stopped without rebound by the inner armor plate wall panels as described.

Additionally, the layers of fibrous insulation material have substantial sound deadening properties and thereby greatly reduce the noise of shooting occurring in one or more adjacent shooting stalls.

My said multiple wall construction will effectively stop, with little or no rebound or ricochet, most bullets used in shooting ranges, for example, bullets of **38** caliber, fired either directly or angularly. The outer metal walls, such as the corrugated walls described, will flatten bullets striking same and the inner fibrous material will additionally dissipate the energy and entrap most slugs and the innermost armor plate will fully stop even the larger slugs which may penetrate said insulation material.

My described invention has many advantages and accomplishments which include the described safety characteristics and protection against wild shots by adjacent users and from ricochet of bullets from the described walls; the economy of erection and assembly; the described acoustical features which absorb sound and impede the transmission of sound waves; the advantageous accessibility to floors and other parts below and near the shooting stalls to permit easy cleaning, and the removability of the counter supports to permit changes in positions of shooting by the users.

While the foregoing specification sets forth the invention in specific terms, it is to be understood that numerous changes in the shape, size and materials may be resorted to without departing from the spirit and scope of the invention as claimed hereinafter, and it is contemplated that various changes may be made in the embodiment of the invention herein specifically described without departing from or sacrificing any of the advantages of the invention or any features thereof, and nothing herein shall be construed as limitations upon the invention, its concept or structural embodiment as to the whole or any part thereof except as defined in the appended claims.

I claim:

1. In a protective stall for shooting ranges;
- a pair of upwardly extending spaced apart multi-ply walls;
- means for supporting said walls in upright positions;
- each of said walls having a frame and outer metal panels connected to said frame,
- and having inner metal plates within and spaced from said outer metal panels;
- fastening elements connecting said inner metal plates to said frame and to each other;
- and a body of fibrous material between said plates and said panels;
- said fibrous material and said outer panels being adapted to substantially reduce the speed and force of missile fragments; and to prevent ricocheting thereof;
- said inner plates being adapted to stop the movement of such fragments.

2. A protective shooting stall substantially as recited in claim **1** and in which said means for supporting said walls includes upper and lower metal channel-like frame members and channel-like front and rear members, and a plurality of metal bars and bolts connecting said metal bars and said inner plates.

3. A protective shooting stall as recited in claim **2** and having a transverse flat panel adjustably mounted between each pair of adjacent walls, and metal brackets for supporting said flat panel and engaging said walls.

4. A protective shooting stall as recited in claim **2** and having said outer metal panels corrugated and having an inner fiber spacing and connecting panel mounted between said inner metal plates.

5. In a plurality of protective stalls for shooting ranges;
- a plurality of upwardly extending horizontally spaced apart walls;
- means for supporting said walls in upright position;
- each of said walls having a metal frame of channel-like cross section and having outer corrugated metal panels mounted within said frame in spaced apart relation,
- each of said walls having a pair of inner metal armor plates spaced inward from said corrugated panels and connected together,
- a fibrous connecting plate between said inner armor plates,
- bolts connecting said plates together and connecting said panels to said frame;
- fiber-like material between each of said armor plates and the adjacent corrugated panel,
- and means for connecting said walls together and for holding same in spaced relation.

6. A plurality of protective stalls for shooting ranges as recited in claim **5** and having suspension brackets mounted on the sides of said walls, and a flat panel removably mounted on portions of each of pair of said brackets between each two adjacent walls.

7. A protective shooting stall for shooting ranges as recited in claim **2**, and in which each of said walls have two upper and two lower corrugated metal panels and a horizontal flanged bar between each pair of said panels.

8. A protective shooting stall as recited in claim **1** in which each of said multi-ply walls comprise an upper and a lower substantially rectangular wall section connected in superposed positions;
- and in which said means for supporting said walls includes upper transverse connecting bars, and wherein each of said wall sections have an elongated T-flanged frame member and a T-shaped bar connected to said flanged frame member and to said inner metal plates.

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