

[54] **BULLETPROOF BAFFLE ARRANGEMENT**

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[51] Int. Cl..... **E06b 7/30**

[58] Field of Search .... 109/10-21.5, 49.5, 58.5, 85;  
89/36 R, 36 A

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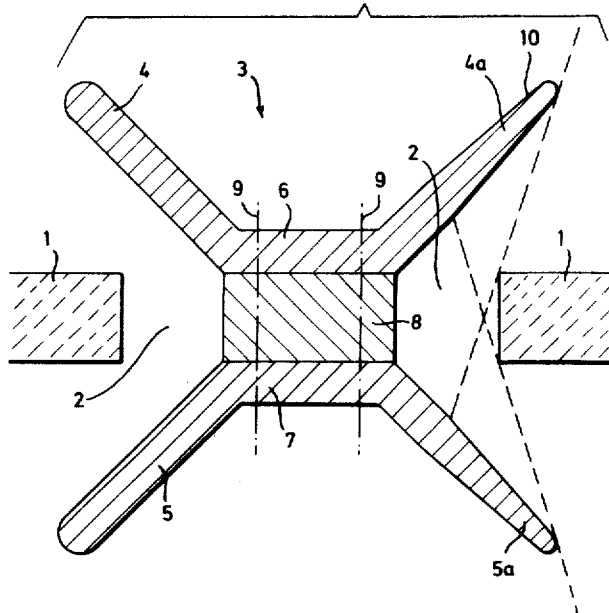
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[57] **ABSTRACT**

A bulletproof baffle member for use within the opening of a bulletproof window or enclosure comprising at least one pair of baffle elements joined to one another to form a symmetrical obliquely shaped arrangement with respect to the plane of the window and including a core material intermediate to the elements to retain and trap a deflected bullet or projectile. Various arrangements and configurations of the intermediate section and core member are provided.

**14 Claims, 4 Drawing Figures**





SHEET 2 OF 2

FIG 2

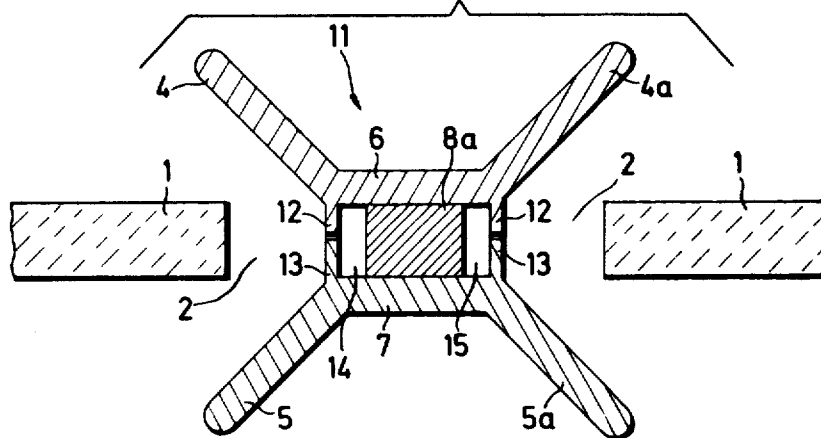


FIG 3

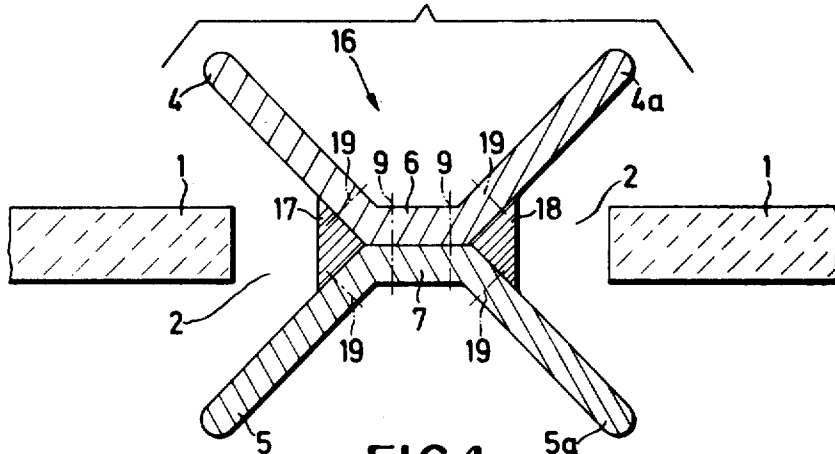
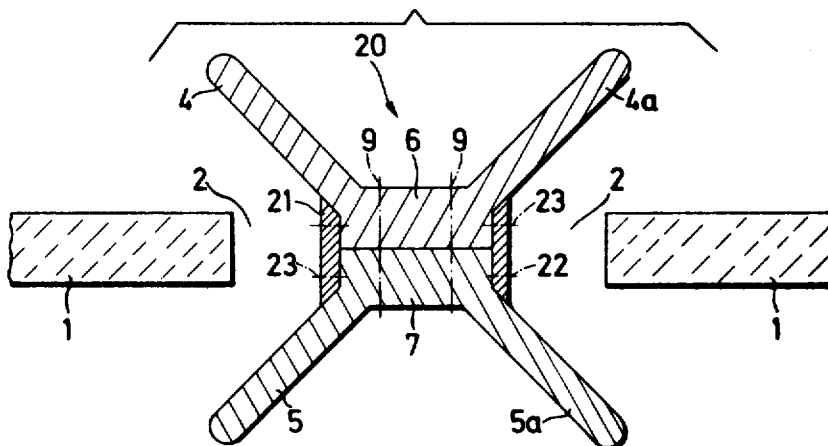


FIG 4



**BULLETPROOF BAFFLE ARRANGEMENT****BACKGROUND OF THE INVENTION**

This invention relates to a bulletproof baffle member for securing the communication opening provided in bulletproof windows or enclosures. Specifically, the described invention is directed to a safety device to prevent a bullet or projectile from being fired through the opening so as to endanger the cashier or attendant.

The security and safety of a cashier or attendant in an enclosure where a large sum of money is contained has been of major importance. The use of a solid sheet of bulletproof glass would be advantageous, but in order to transact business an opening of some nature must be provided through the enclosure, whenever the necessary opening is provided, there exists the possibility of a robbery with the insuing danger to the life of the cashier or attendant. In order to improve security against firearms and still provide the capability for the conduction of sound for communications and the transfer of articles, various baffle and opening arrangements have been attempted. It has been known in the prior art to arrange baffles obliquely to the window in series fashion. However, it has been found that the use of baffles in this arrangement along with the use of metal as a material for the baffles has resulted in the possibility of a bullet fired into the baffles being caused to ricochet, with the result that the bullet passes through the speech channel into the enclosure. Thus, the person within the enclosure is endangered by the glancing projectile. This is especially true when the material used in the baffle construction is of sufficient hardness to provide bulletproof characteristics which results in the increased tendency for the bullet to ricochet.

**OBJECT OF THE INVENTION**

The main object of this invention is to provide a security baffle arrangement for the safety of personnel which prevents or reduces the possibility of a bullet fired at the baffle from ricocheting.

Another object is to provide a design for a baffle arrangement where the bullet is caused to deflect into an absorbing material for the purpose of holding or trapping the projectile.

A further object is to provide a baffle arrangement for the security of personnel which is both reliable and yet economical to fabricate and install.

**SUMMARY OF THE INVENTION**

This invention is directed to a bulletproof baffle arrangement for use in the communication opening within a bullet-proof window or enclosure. An enclosure such as this is usually provided in banks or cashier areas to protect the cashier or clerk from the danger of robbery. The baffle arrangement includes at least one pair of baffle elements joined to one another by an intermediate member or section and arranged in the communication opening in such a way that the baffle elements extend obliquely and symmetrically within the opening relative to the plane of the window. It is understood that the intermediate member is to be generally located within the plane of the window. A core or absorbing section is provided in conjunction with the intermediate member or the intersecting area between the baffle elements whereby a bullet or projectile deflected or shot into the core material will be retained and absorbed so as to prevent ricocheting. Each baffle

element is designed of sufficient thickness and material to be considered bulletproof.

It is intended that the baffle elements will absorb the impact of the fired bullet and deform the bullet to dissipate its stored energy with a minimum possibility of ricocheting.

Various configurations of the intermediate section and the core trap material are provided. Various surface treatment for the areas within the plane of the bulletproof window is disclosed to aid in the entrapment and dissipation of the energy of the projectile.

**BRIEF DESCRIPTION OF DRAWINGS**

Other objects of this invention will appear in the following description and appended claims, reference being made to the accompanying drawings forming a part of the specification wherein like reference characters designate corresponding parts in the several views.

FIG. 1 is a diagrammatic cross-section view of a baffle member according to the present invention; and

FIGS. 2, 3 and 4 are diagrammatic cross-sectional views of further embodiments of the present invention.

**DESCRIPTION OF SPECIFIC EMBODIMENTS**

With specific reference to FIG. 1, a bulletproof barrier is shown which includes a bulletproof glass or the like forming a window 1 or enclosure around a protected area. A metal baffle member assembly shown generally at 3 is positioned within an opening 2 in the window 1 for the purpose of verbal communication and/or the passing of objects, such as money. The assembly 3 is composed of baffle elements 4, 5 and 4a, 5a, wherein each pair is arranged so that the elements 4, 5 and 4a, 5a extend obliquely from the plane of the window 1. Each pair of baffle elements is arranged symmetrically relative to the plane of the window, and the connecting element or intersection of baffle pair lies within the plane of the window. In this embodiment, as can be seen in FIG. 1, the two pairs of baffle elements 4, 5 and 4a, 5a are arranged in a cross or cruciform shape. A longitudinally extending intermediate section 6, 7 interconnects the two baffle elements on each side of the plane of the window 1, making it possible to form the two elements 4, 4a or 5, 5a as one single unit. Between the baffle units 4, 4a and 5, 5a is arranged a core member 8. The baffle elements and intermediate sections can be formed from any material which exhibits a bulletproof characteristic, such as metal, hardened glass, or the like. The core member 8 is also formed from bulletproof material, but this material must in addition have the ability of being able to absorb or trap a bullet which is not deflected. Materials which can be used for this purpose include soft metal, plastics, plexiglass, hardwood, or the like. The core 8 can be rigidly connected to the intermediate sections 6, 7 of the baffle members in any suitable manner such as by the use of screws, rivets, or the like, or by various joining processes such as welding, pressing, adhesive bonding, etc. The ends of the baffle members and core are firmly secured to the opposite edges of the window 1 around the opening 2 or, if desired, can be secured to the frame or support for the window. Other methods are possible depending upon the particular design and use of the baffle assembly.

The ends 10 of the pair of baffle elements 4, 5 and 4a, 5a extend sufficiently beyond the edges of the opening 2 in the bulletproof window 1 such that there is no

possibility of a bullet passing directly through the opening without being diverted. The baffle elements are formed in a thickness which will provide the bullet-proof characteristics desired, and the end portions of each of the baffle elements may be tapered or reduced in cross-section from a point beyond the furthest calculable impact point for a bullet, as indicated by the dotted lines in FIG. 1, to the outer edge 10, as shown with respect to baffles 4a and 5a. This modification tends to improve the appearance of the baffle assembly.

By the addition of the core 8 between or at the junction of the baffle elements 4, 5 and 4a, 5a, a bullet striking the inner surfaces of a baffle pair deforms the elements and is deflected into the core portion. The bullet in deforming the element material is flattened or distorted, thus removing the bullet's ballistic flatness and thus its striking power. The bullet is then deflected into the core material 8 where the remaining energy is absorbed and the bullet is essentially trapped. If ricocheting from the elements 4, 5 or 4a, 5a does occur, the bullet will be essentially spent and reduced in velocity so that it is no longer dangerous. In most cases, the bullet will not have a penetrating effect but will more or less drop downwards as its energy is spent. Thus, even with metal baffle elements the baffle arrangement 3 according to the present invention will serve as a reliable shield and bullet trap.

In FIG. 2, the baffle arrangement member 11 includes a core 8a design which is not exposed to the communication opening 2. In this embodiment the inner edges of the intermediate sections 6, 7 are provided with side facing edges 12, 13. The edges or legs 12, 13 are intentionally kept thin and are separated from the core material 8a by void or hollow spaces 14, 15. A bullet striking the thin side members 12, 13 deforms both itself and the members 12, 13. These members bend inwardly in the direction of the hollow spaces 14, 15 so that a bullet entering the area between the baffle elements 4, 5 or 4a, 5a is trapped in the hollow space 14 or 15 and the core material 8a.

In FIG. 3, another embodiment of the present invention is shown wherein the intermediate sections 6, 7 of the baffle portions 4, 4a and 5, 5a directly contact or engage their inner surfaces. The baffle elements abut each other and form an acute angle between elements. At this junction, angular flexible strips 17, 18, fabricated from the same material as core element 8 or 8a, are located and shaped in substantially a triangular cross-section so as to complement the acute intersecting angle. The strips 17, 18 are connected to the baffles in any suitable manner such as by a retaining or fastener means 19.

The embodiment shown in FIG. 4 is similar to the previous embodiment except that the intermediate sections 6, 7 are designed with a base surface extending transversely to the plane of the window 1 and having an additional cross-sectional width. The base surfaces lie parallel to the edge of the opening in window 1. The strips 21 fabricated from flexible material such as that used in core 8 or 8a serves as a bullet trap and is attached to the base sides 6a, 7a and 6b, 7b. Retainer or fastener means 22, 23 are used to secure the strips to the base surfaces. It is to be understood that the trap strips 21, 17, 18 and the core members 8 or 8a are intended to run the full length of the baffle arrangement. The surfaces located within the plane of the window 1 and lying between the baffle elements 4, 5 or 4a, 5a and

forming the edges of the communication openings 2 can be provided with roughened surfaces, ribs or surface protuberances, or the like, in order to better trap and retain the bullet or projectile. If desired, these surfaces when viewed in cross-section can be curved in a concave or convex manner to improve their functional capability.

It is to be understood that the baffle elements can be disposed in any arrangement so long as a general cruciform or X shape is obtained when used in a double pair arrangement. The intermediate sections 6 and 7 can be completely omitted if desired. When only a single pair of baffle elements are utilized, the pair are arranged in a V-shape with or without the intermediate section. The apex or intersecting portion between the baffle elements would be connected directly to the bulletproof glass of the window or its frame. In another arrangement, the baffle elements themselves can be integrally formed with one another to form the double pair or single pair of obliquely positioned baffle elements.

While the bulletproof baffle arrangement has been shown and described in detail, it is obvious that this invention is not to be considered as being limited to the exact form disclosed, and that changes in detail and construction may be made therein within the scope of the invention without departing from the spirit thereof.

I claim:

1. A device for positioning in an opening in a bullet-proof member permitting communication through said opening while preventing the firing of bullets there-through comprising

- a. a baffle member having two pairs of bullet-deflecting panels, the panels of each pair being arranged in a generally V-configuration with the open sides between the spaced free edges of each of said pairs of panels facing in opposite directions and the panels projecting a sufficient distance such that the overall width of said device is greater than the width of the opening, and
- b. means extending between said panels of each pair adjacent the apex of said V-configuration for absorbing and trapping a fired bullet,
- c. whereby a bullet striking said device in the vicinity of said apex will be absorbed and not ricochet through the opening.

2. The invention of claim 1 wherein said bullet-deflecting panels are arranged to form in cross-section a cruciform configuration.

3. The invention of claim 1 wherein said means for absorbing and trapping a fired bullet comprises a relatively soft resilient material extending between said panels of each pair adjacent the apex of said V-configuration.

4. The invention of claim 3 wherein said material is selected from soft metal, plastic, plexiglass and hardwood.

5. The invention of claim 1 wherein said means for absorbing and trapping a fired bullet comprises flexible elements extending towards each other from said panels of each pair a spaced distance from the apex of said V-configuration forming a hollow space for receiving a fired bullet passing between said flexible elements.

6. A device for positioning in an opening in a bullet-proof member permitting communication through said opening while preventing the firing of bullets there-through comprising

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- a. a baffle member having at least one pair of bullet-deflecting panels, the panels of said pair being arranged in a generally V-configuration with an open side between the spaced free edges of said panels, said panels projecting a sufficient distance such that the overall width of said device is greater than the width of the opening, and
- b. means extending between said panels adjacent the apex of said V-configuration for absorbing and trapping a fired bullet,
- c. whereby a bullet striking said device in the vicinity of said apex will be absorbed and not ricochet through the opening.

7. The invention of claim 6 wherein said means for absorbing and trapping a fired bullet comprises a relatively soft resilient material extending between said panels adjacent the apex of said V-configuration.

8. The invention of claim 7 wherein said material is selected from soft metal, plastic, plexiglass and hardwood.

9. The invention of claim 6 wherein said means for absorbing and trapping a fired bullet comprises flexible elements extending towards each other from said panels a spaced distance from the apex of said V-configuration forming a hollow space for receiving a fired bullet passing between said flexible elements.

10. An improved bulletproof construction permitting communication therethrough comprising

- a. a bulletproof panel having an opening therein, and
- b. a baffle member positioned in said opening and having two pairs of bullet-deflecting panels, the panels of each pair being arranged in a generally

V-configuration with the open sides between the spaced free edges of each of said pairs of panels facing in opposite directions and the panels projecting a sufficient distance such that the overall width of said baffle member is greater than the width of said opening.

c. said baffle member including means extending between said panels of each pair adjacent the apex of said V-configuration for absorbing and trapping a fired bullet,

d. whereby a bullet striking said baffle member in the vicinity of said apex will be absorbed and not ricochet between said bullet-deflecting panels and the bulletproof panel through said opening.

11. The invention of claim 10 wherein said bullet-deflecting panels are arranged to form in cross-section a cruciform configuration.

12. The invention of claim 10 wherein said means for absorbing and trapping a fired bullet comprises a relatively soft resilient material extending between said panels of each pair adjacent the apex of said V-configuration.

13. The invention of claim 12 wherein said material is selected from soft metal, plastic, plexiglass and hardwood.

14. The invention of claim 10 wherein said means for absorbing and trapping a fired bullet comprises flexible elements extending towards each other from said panels of each pair a spaced distance from the apex of said V-configuration forming a hollow space for receiving a fired bullet passing between said flexible elements.

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