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**AT BE CH DE DK ES FR GB GR IT LI LU MC
NL PT SE**(71) Applicant: **STRUKTON STAALBOUW B.V.**
Westkanaaldijk 2
NL-3606 AL Maarssen(NL)
Applicant: **AUTRON B.V.**
Wijnhaven 118
NL-3011 WV Rotterdam(NL)(72) Inventor: **Hartog, Jacobus**
Weegbree 145
NL-2923 GL Krimpen a/d IJssel(NL)(74) Representative: **Vollebregt, Cornelis Jacobus**
Algemeen Octrooibureau P.O. Box 645
NL-5600 AP Eindhoven(NL)(54) **Bullet catcher.**

(57) The invention relates to a device for catching bullets, provided with a guiding surface consisting of an impact-resistant material, which slopes downwards at an angle of less than 30° to the horizontal, when seen in the direction of movement of the projectile to be caught. Behind the guiding surface means are provided for catching the bullet rests.

Preferably a second impact-resistant guiding surface is disposed opposite the guiding surface, said second guiding surface sloping upwards at an angle of less than 30° to the horizontal, when seen in the direction of movement of the bullet to be caught. In an effective embodiment the guiding surfaces are formed by the flanges of rails arranged side by side.

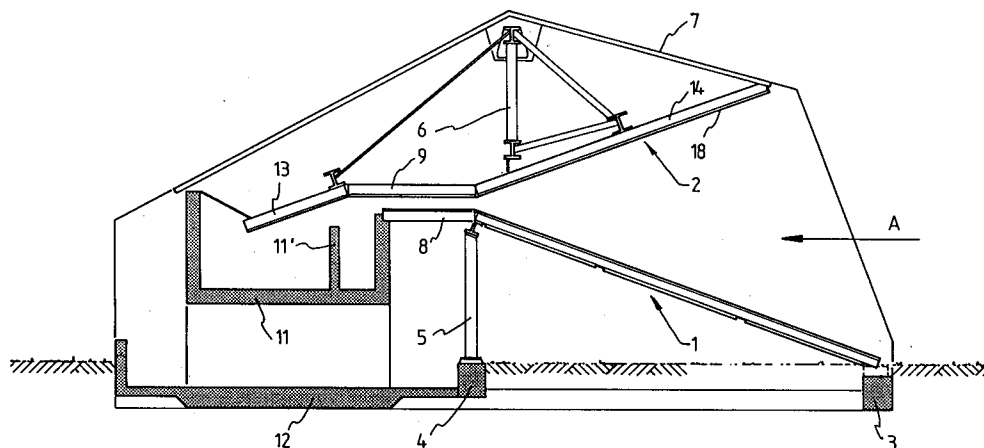


Fig 1

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The invention relates to a device for catching bullets.

On shooting ranges it has so far been customary to catch bullets fired by means of rifles, submachine guns, pistols and the like in a stop butt formed by a heap of sand, which is disposed near one end of the shooting range in question. Said sand is strongly contaminated by the bullet rests, which usually contain lead and/or copper, so that this contaminated sand must be considered to be chemical waste, the discharge, storage and possible purification of which involves rather a great deal of expense.

The object of the invention is therefore to obtain a device for catching bullets, by means of which an efficient catching of the bullets or the like can be effected, whilst avoiding as much as possible the production of contaminants which are difficult to process.

According to the invention this can be achieved in that the device is provided with a guiding surface consisting of an impact-resistant material, which slopes downwards at an angle of less than 30° to the horizontal, when seen in the direction of movement of the projectile to be caught, whilst behind the guiding surface means are provided for catching the bullet rests.

In practice it has appeared that when using such a guiding surface consisting of an impact-resistant material, which includes only a comparatively small angle with the horizontal, an effective catching of bullets or the like projectiles can be achieved without undesirable damage being done to the guiding surface as a result of the bullets being caught, whilst the bullets caught in this manner can be caught in an effective manner in a space of limited dimensions, which is located behind the guiding surface.

Preferably a second impact-resistant guiding surface is disposed opposite the guiding surface, said second guiding surface sloping upwards at an angle of less than 30° to the horizontal, when seen in the direction of movement of the bullet to be caught.

By using two opposite guiding surfaces a shorter construction of the device, when seen in the direction of movement of the bullet to be caught, can be obtained than when only one single guiding surface is used.

A very efficient construction is obtained when the guiding surface is formed by the flanges of track rails arranged side by side. Track rails are generally made of a very high-grade steel and are very resistant to weather influences. Since use is thereby made of the flanges to form the actual guiding surface, it is possible to use rails which have been declared unfit for railway use, i.e. of comparatively inexpensive scrap material.

The invention will be explained in more detail hereafter with reference to a few possible embodiments of a device according to the invention illustrated in the accompanying Figures.

Figure 1 diagrammatically shows a section of a first embodiment of a device according to the invention.

Figure 2 diagrammatically shows the construction of an upper guiding surface of a plurality of rails arranged side by side.

Figure 3 diagrammatically shows the construction of a lower guiding surface built up of rails.

Figure 4 diagrammatically shows a section of a second embodiment of a device according to the invention.

The device shown in Figure 1 comprises a first guiding surface 1 and a guiding surface 2 disposed thereabove. The guiding surface 1 slopes upwards from the left towards the right, when seen in Figure 1, at an angle of $\pm 20^\circ$ to the horizontal, whilst the guiding surface 2 slopes downwards from the right towards the left, when seen in Figure 1, likewise at an angle of $\pm 20^\circ$ to the horizontal.

At its right-hand end the guiding surface 1 is supported by a foundation beam 3 and at its left-hand end by columns 5 disposed on a foundation beam 4.

The upper guiding surface 2 is suspended, by means of a truss 6, from a covering 7 housing the device.

Further horizontally extending guiding surfaces 8 and 9 join the ends located near and directly above each other of the guiding surfaces 1 and 2 respectively, whereby the construction is such that at its side remote from the guiding surface 2 the upper guiding surface 9 extends beyond the lower guiding surface 8.

The end remote from the guiding surface 1 of the guiding surface 8 joining the guiding surface 1 is supported on an upright wall of a trough 11, e.g. made of concrete, said trough in turn being placed in a trough 12, e.g. made of concrete, which trough 12 has a larger ground surface than the trough 11 and which at one side is bounded by the foundation beam 4 in the illustrated embodiment.

A further guiding surface 13 joins the end of the guiding surface 9 remote from the guiding surface 2, said guiding surface 13 sloping downwards from the guiding surface 9, thereby including an angle of $\pm 20^\circ$ with the horizontal. The end of the guiding surface 13 is disposed at some distance from the most left-hand wall of the trough 11, when seen in Figure 1.

As is illustrated in more detail in Figures 2 and 3 the guiding surfaces are preferably built up of rails located side by side. As is shown in Figure 2 the upper guiding surface 2 is thereby built up of rails 14 disposed side by side, said rails extending

from the right towards the left, parallel to the plane of drawing, when seen in Figure 1. The rails are subdivided into groups of interconnected rails located side by side, so that such groups of rails can be easily exchanged, if desired. In the illustrated embodiment such a group consists of four rails extending parallel to each other, which are interconnected by means of bolts 15 extending perpendicularly to the rails. The bolts 15 are surrounded by sleeves 16, to which arms 17 are secured for suspending the upper guiding surface. As will be apparent the flanges 18 of the rails thereby form the actual guiding surface located opposite the guiding surface 1.

As is furthermore illustrated in Figure 2 the slits between the abutting ends of the flanges 18 of the rails may be closed by means of bars 19 provided near said slits, which are welded to only one of the respective flanges.

The guiding surfaces 8, 9 and 13 may be built up of rails in a similar manner.

Generally the bullets or the like projectiles will mostly hit the lower guiding surface 1 during normal operation of the device. In connection therewith the construction shown in Figure 3 will be preferred for the guiding surface 1, wherein rails 20 and 21 are arranged side by side, alternately being turned through 180° with respect to each other.

The abutting flanges 22 of the rails 20 will thereby form the actual guiding surface co-operating with the projectiles. Said flanges 22 are furthermore supported in an effective manner, in points spaced from the webs of the rails, by the heads of the rails 21. In this manner a solid, heavy construction of the lower guiding surface is obtained, which, as a result of the double arrangement of the rails, will be practically impenetrable to bullets or the like projectiles, whilst as a result of the heavy construction it will also be prevented that undesirable noise effects are produced.

During use of the device the trough 11 will be filled with water or a similar liquid.

Bullets or the like projectiles are fired at the device in the direction indicated by the arrow A and generally caught by the lower guiding surface 1 or possibly by the upper guiding surface 2 thereby. It has become apparent that as a result of the selected inclination at which the two guiding surfaces extend, undesirable damage to the two guiding surfaces can at least substantially be avoided.

The bullets or bullet rests caught move on through the small passage between the guiding surfaces 8 and 9, after which they are deflected by the guiding surface 13 and land into the liquid present in the trough 11, where they are decelerated by said liquid.

A partition 11' in the trough 11 may be provided with holes, so that said partition acts as a

wash plate, so as to prevent undesirable oscillation of the liquid. It is also possible to use an entirely closed partition 11' and to use the space to the right of said partition for catching water splashing over, which may then be pumped back, by means of a pump not shown, into the space located to the left of the partition 11', when seen in Figure 1.

The trough 12 is provided to catch any water splashing from the trough 11.

At set intervals the metal parts caught in the water can be removed in a simple manner by means of screening techniques or the like. In comparison with the usual stop butts, which are built up of sand, a relatively small amount of waste material is obtained hereby, which, in the form of scrap metal, lends itself very well for further environmentally sound removal *casu quo* processing.

Figure 4 shows a somewhat simpler embodiment of a device for catching bullets according to the invention. This device is provided with two guiding surfaces 23 and 24 corresponding to the guiding surfaces 1 and 2 of the above-described device. A horizontally extending guiding surface 25 abuts the upper guiding surface 24. A further guiding surface 27 is disposed between the end of the guiding surface 25 remote from the guiding surface 24 and a sandbox disposed thereunder.

It will be apparent that bullets or the like projectiles may be caught by means of this device in a similar manner as described above. Objects moving through the slit between the ends of the guiding surfaces 23, 24 located near each other will be caught by the guiding surface 27 and eventually land in the sandbox 26.

Also here only a comparatively small amount of material containing metal rests will have to be removed at set intervals.

Claims

1. A device for catching bullets, characterized in that the device is provided with a guiding surface consisting of an impact-resistant material, which slopes downwards at an angle of less than 30° to the horizontal, when seen in the direction of movement of the projectile to be caught, whilst behind the guiding surface means are provided for catching the bullet rests.
2. A device according to claim 1, characterized in that a second impact-resistant guiding surface is disposed opposite said guiding surface, said second guiding surface sloping upwards at an angle of less than 30° to the horizontal, when seen in the direction of movement of the bullet to be caught.

3. A device according to claims 1 and 2, characterized in that one guiding surface includes an angle of $\pm 20^\circ$ with the horizontal.

4. A device according to claim 2 or 3, characterized in that further guiding surfaces extending parallel and at least substantially horizontally join the ends of the guiding surfaces located near each other, the upper one of said further guiding surfaces extending beyond the lower guiding surface, when seen in the intended direction of movement of the bullet to be caught, and blending into a downwardly sloping guiding surface, whose end is located above the means for catching the bullet rests.

5. A device according to any one of the preceding claims, characterized in that said means for catching the bullets are formed by a liquid-containing trough.

6. A device according to claim 5, characterized in that the liquid-containing trough is disposed in a further trough, which has a larger base area than said liquid-containing trough.

7. A device according to any one of the preceding claims, characterized in that said guiding surfaces are formed by the flanges of rails arranged side by side.

8. A device according to claim 7, characterized in that said rails are combined into groups, whereby each group of rails can be mounted or dismounted, as the case may be, independently of the other rails.

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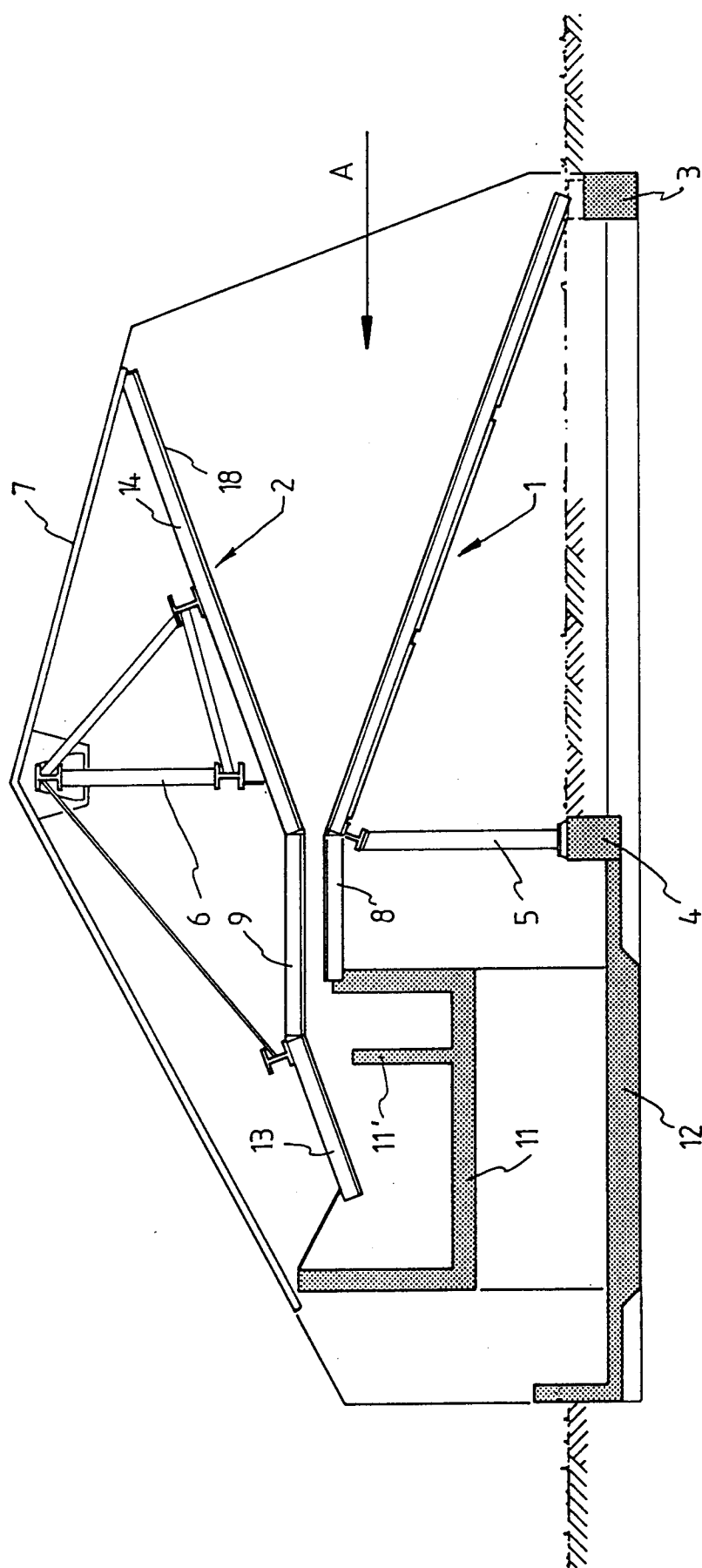
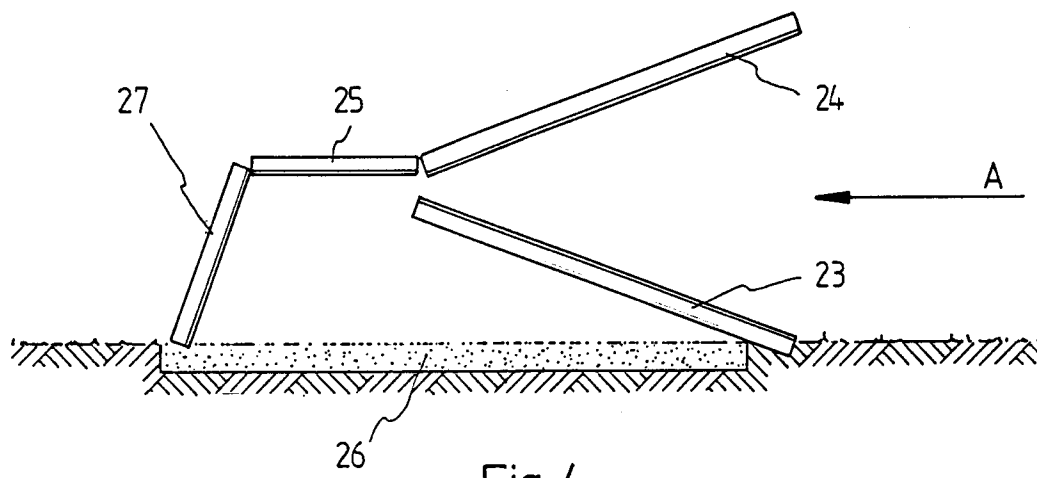
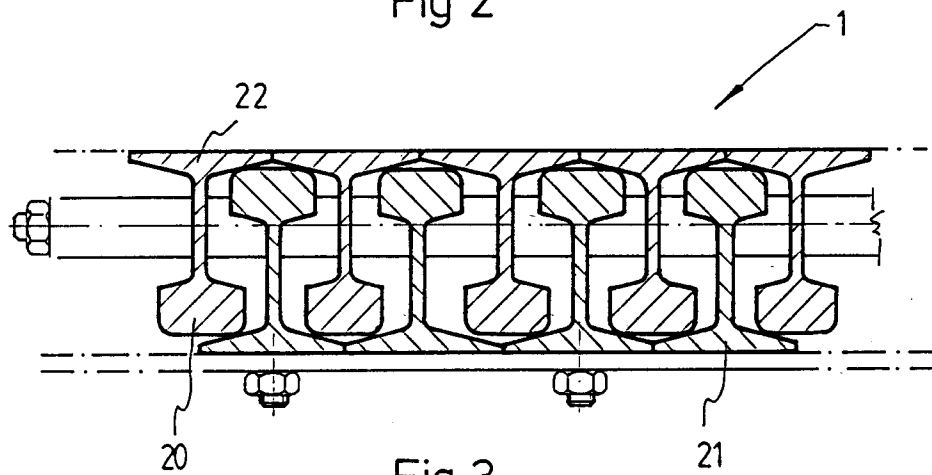
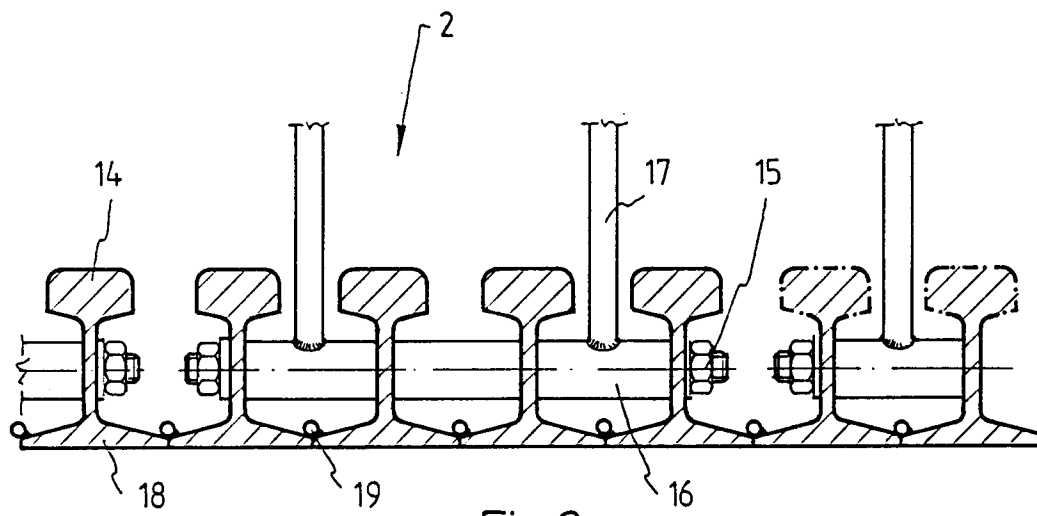


Fig 1





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EUROPEAN SEARCH REPORT

Application Number

EP 92 20 2116

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
X	BE-A-681 425 (KLÖKNER-WERKE) * page 1, line 1 - page 3, line 1 * * page 4, last paragraph - page 5, line 2; claims; figure 2 * ---	1,3,5-9	F41J1/12
X	DE-C-316 195 (KIEHNEL) * the whole document * ---	1,3,5-9	
X	US-A-2 420 304 (DIEM) * the whole document * ---	1,3,5-9	
X	US-A-3 701 532 (NIKODEN) * the whole document * ---	1-4,6-9	
X	US-A-2 772 092 (NIKODEN) * column 2, line 26 - line 57; figure 2 * ---	1-4	
X	FR-A-1 288 152 (LOBERT) * the whole document * -----	1-3	
			TECHNICAL FIELDS SEARCHED (Int. Cl.5)
			F41J
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 12 OCTOBER 1992	Examiner DOUSKAS K.
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			