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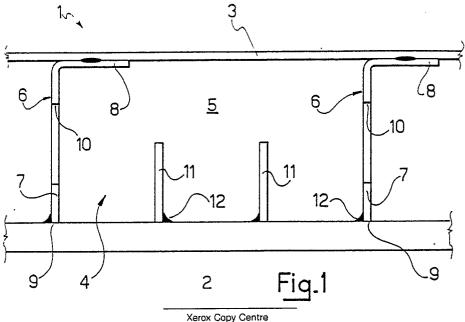
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- 🖾 An armor plate wall structure for safes, security spaces at banks, and the like.
- An armor plate wall structure for safes, security spaces at banks, and the like, being of a type which comprises an outer wall (2) and an inner wall (3) set at a fixed distance apart and defining an interspace (4) therebetween adapted to be filled with a security material (3), further comprises a plurality of brackets (11) made rigid with the outer wall (2) and extending vertically cantilever-fashion therefrom toward the interspace (4) over the full height of the wall (2). This structure (1) can validly resist attacks performed with the so-called de-lamination or exfoliation technique.



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This invention relates to an armor plate wall structure for safes, security spaces at banks, and the like, being of a type which comprises an outer wall and an inner wall set at a fixed distance apart and defining an interspace therebetween adapted to be filled with a security material.

As is known, the armor plate walls of safes or for security areas are usually formed by laminating together different materials each specifically designed to resist some particular thermal or mechanical tamper means.

This invention is directed to fill a long-felt need for an armor plate wall which be specially resistant to tampering by the so-called de-lamination or exfoliation technique.

The de-lamination technique consists of removing one by one all the material layers which make up the wall.

To meet the above-noted demand, the prior art provides for the use of special steel alloys, such as manganese steel, or of some other composite materials, such as aluminum alloys, copper alloys, and cast irons inglobating corindon granules.

While being generally advantageous, walls so formed have the drawback of being expensive to manufacture. In addition, not even the use of such expensive special materials can make a wall invulnerable to attacks performed with the de-lamination technique.

The technical problem underlying this invention is to provide an armor plate wall structure for safes and the like, which has such construction and performance characteristics as to defeat any attacks carried out with a thermal or mechanical means, or the so-called de-lamination technique, thereby obviating the above-noted drawbacks affecting the prior art.

This problem is solved by a wall structure being characterized in that it comprises, inside said interspace, a plurality of brackets made rigid with said outer wall in cantilever relationship therewith.

The features and advantages of the wall structure according to the invention will become apparent from the following detailed description of an exemplary embodiment thereof, to be taken by way of illustration and not of limitation in conjunction with the accompanying drawings.

In the drawings:

Figure 1 is a top plan view of the wall structure according to the invention; and

Figure 2 is a top plan view of a modified embodiment of the structure shown in Figure 1.

With reference to the drawing views, the numeral 1 designates schematically an armor plate wall structure according to this invention. The structure 1 is particularly intended to form the

peripheral armor of either a safe, not shown, or a security area of a bank.

The structure 1 comprises an outer wall 2 and an inner wall 3 held at a predetermined distance apart and defining an interspace 4 intended for filling with a security material such as a cement mix 5.

The outer wall 2 is thicker than the inner wall 3, and is formed from large thickness plate metal, e.g. 10 to 15 mm thick.

More detailedly, the walls 2 and 3 are held at a constant distance apart and stiffened by means of partitions 6 consisting of sheet metal angle sectional members 7. Such angle members 7 have a flat flange portion 8 welded to the inner wall 3 and an opposedly located web 9 welded to the outer wall 4 all along its longitudinal extension.

Also provided are holes 10 formed through the angle members 7 to put the various portions of the interspace 4 in mutual communication for improved spreading of the cement mix 5.

Advantageously according to the invention, there are provided a plurality of brackets 11 made of some metallic material which are made rigid with the outer wall 2 in cantilever relationship therewith inside said interspace 4. Each of said brackets 11 extends along a vertical direction and is welded to the wall 2 by means of a so-called stress weld 12. The brackets 11 are laid at close intervals and, in a preferred embodiment, placed at constant pitch spacings of 5 cm.

Each bracket 11 is welded to the wall throughout its vertical extension. Each bracket 11, moreover, projects inwardly of the interspace 4 by approximately one half the thickness of the latter.

Understandably, the invention also contemplates the provision of a number of bracket segments in vertically aligned relationship and affixed leaving gaps therebetween.

A modified embodiment will be now described of the wall structure according to the invention. In this modified embodiment, items and cooperating parts which have the same structure and perform in the same manners as in the former embodiment are denoted with the same reference numerals.

With reference to Figure 2, a wall structure 15 according to the invention comprises box-type stiff-ening rib formations 13 each affixed to either walls, 2 and 3. The ribs 13 have an isosceles trapezoidal cross-section shape with the major base removed and the minor base portion welded to the inner wall 3.

Formed in turn through such ribs 13 are holes 10 for passing and distributing the cement mix 5. Further, the longitudinal edges 16 of each rib 13 are welded to the wall 2 by stress welds 12 spanning the full height of the wall.

The wall structure according to the invention is

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In particular, this structure can be assembled from inexpensive non-special materials, since its strength comes more from the monolythic character of its construction than the nature of the materials employed.

Should this structure be attacked with thermal means in an attempt to cut the outer wall along a closed line, to then pry it up by means of a crowbar, the brackets provided inside the interspace resist such a bending effort by acting in constraint. A thermal means, moreover, would meet at the point of attachment of each bracket to the wall a change in the material thickness effective to make the cut quite difficult to perform.

The wall structure of this invention has the additional advantage of being strengthened by the stress welds spanning the full vertical extension of the connected members, and that it can be easily filled with the security material throughout.

Claims

- 1. An armor plate wall structure (1) for safes, security spaces at banks, and the like, being of a type which comprises an outer wall (2) and an inner wall (3) set at a fixed distance apart and defining an interspace (4) therebetween adapted to be filled with a security material (5), and characterized in that it comprises, inside said interspace (4), a plurality of brackets (11) made rigid with said outer wall (2) in cantilever relationship therewith.
- 2. A wall structure according to Claim 1, characterized in that said brackets (11) are laid to extend along a vertical direction.
- 3. A wall structure according to Claim 1, characterized in that said outer wall (2) has a greater thickness than said inner wall (3).
- 4. A wall structure according to Claim 1, characterized in that said brackets (11) are made rigid with said wall (2) by means of stress welds (12).
- 5. A wall structure according to Claim 3, characterized in that said outer wall (2) has a large thickness dimension, being in particular more than 10 mm thick.
- 6. An armor plate wall structure for safes, security spaces at banks, and the like, being of a type which comprises an outer wall (2) and an inner wall (3) set at a fixed distance apart and defining an interspace (4) therebetween adapted to be filled with a security material (5), and characterized in that it comprises, inside said interspace (4), a plurality of box-type stiffening rib formations (13) wherein each rib (13) is affixed to either said outer and inner walls (2,3).

7. A wall structure according to Claim 6, characterized in that each said rib (13) has an isosceles trapezoidal cross-section shape with the major base removed.

8. A wall structure according to Claims 6 and 7, characterized in that each said rib (13) has its minor base portion of the trapezoidal cross-section affixed to the inner wall (3).

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EUROPEAN SEARCH REPORT

EP 88 11 6985

Category	Citation of document with indicat of relevant passage		Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl. 4)
Χ	FR-A-1 317 984 (FICHE * Page 1, column 1, pa figures 1-14 *	T)	1,2	E 05 G 1/024
Υ	ingures 1-14 "	•	3,4,5	
Y	DE-A-3 533 555 (BODE- * Figure 2 *	PANZER)	3,4,5	
Y	DE-C- 377 903 (HERMA * Page 2, lines 17-68;		6,7	
Y,A	DE-A-2 705 741 (BODE- * Figure 4 *	PANZER)	6,7,8	
Α	FR-A-2 459 351 (FICHE * Page 3, lines 22-26		1,2	
A	DE-A-3 400 818 (BODE- * Page 7, lines 4-12;	PANZER) figure 1 *	6,7,8	
				TECHNICAL FIELDS SEARCHED (Int. Cl.4)
				E 05 G E 06 B
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	The present search report has been d	lrawn up for all claims		
Place of search THE HAGUE		Date of completion of the search 17-01-1989	NEYS	Examiner B.G.
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		E: earlier patent	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	