

Oct. 11, 1955

J. O. BILLUPS

2,720,105

RADIATION SHIELD BLOCK

Filed Aug. 2, 1950

FIG. 1

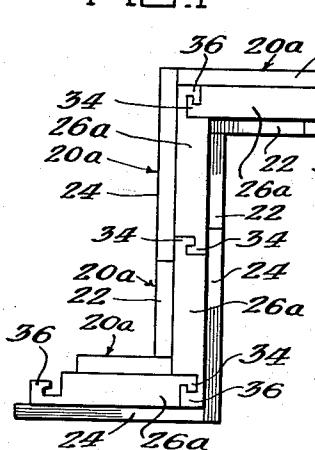


FIG. 2

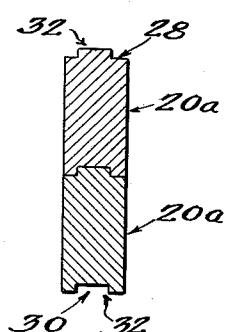


FIG. 3

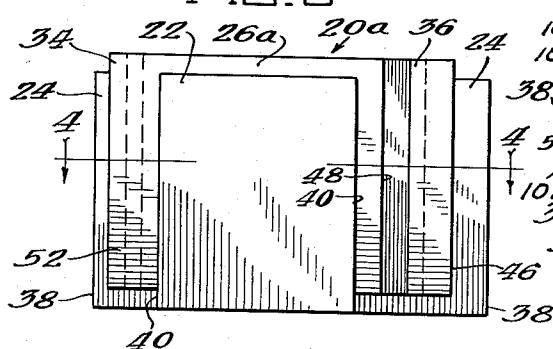


FIG. 4

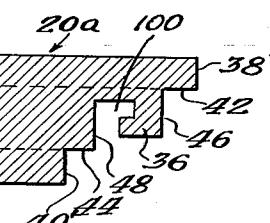
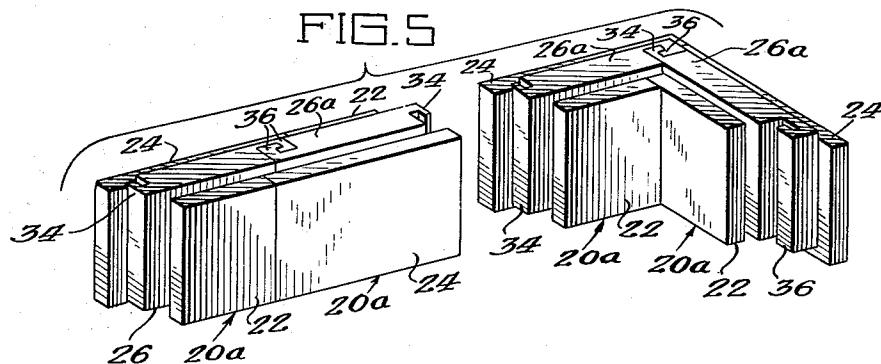


FIG. 5



INVENTOR.
James O. Billups.

BY

Roland A. Anderson

Attorney

1

2,720,105

RADIATION SHIELD BLOCK

James O. Billups, Manhattan Beach, Calif., assignor, by mesne assignments, to the United States of America as represented by the United States Atomic Energy Commission

Application August 2, 1950, Serial No. 177,318

2 Claims. (Cl. 72—38)

This invention relates to radiation shield blocks and to building walls constructed therefrom.

The invention proposes a building block to be used for erecting temporary structures. Such a block is primarily useful in laboratory areas for the storage of materials emanating harmful radioactivity, such as radium. This purpose requires not only that the blocks be made of the appropriate shielding material such as lead, but also that the wall be devoid of straight passages extending from one side to the other. Accordingly, an object of the invention is to provide a structurally interlocking building block capable of completely preventing the penetration of all types of radiation.

Another object is to provide such a block which can be rapidly and repeatedly assembled and disassembled without the use of mortar or similar structural ties.

A further object of the invention is to provide a single building block capable of assembly in different ways to make a continuous wall or corners.

By virtue of these objects the result has been the development of a block having application to general construction purposes as well as to shielding radioactivity. For example the blocks may be used as temporary shields for radioactivity if they are made of lead. They may also be used as toys if made of plastic or other light material. Moreover, they may be used as structural building blocks or panels if properly proportioned and if suitable material is chosen for making them.

For a more particular description reference is made to the following figures in which:

Figure 1 is a plan view of several of the blocks constituting one embodiment of the invention assembled to form a portion of a wall;

Figure 2 is a vertical sectional view of two blocks taken on the line 2—2 of Figure 1;

Figure 3 is an elevational view of one block of the embodiment shown in Figure 1;

Figure 4 is a horizontal sectional view taken on the line 4—4 of Figure 3;

Figure 5 is a perspective view of several blocks indicating the straight and corner constructions illustrating the embodiment shown in Figure 1.

The block forming the subject matter of the present invention is generally indicated at 20a. Each block is divided into three portions which include a pair of outer portions 22 and 24, and an intermediate portion generally indicated at 26a, which is sandwiched between said outer portions. The outer portions 22 and 24 are rectangular parallelepipeds. In addition, the portions 22 and 24 have equal dimensions of height and thickness. The difference between portions 22 and 24 is in the length of portion 24 which is greater than that of portion 22. In all embodiments the portion 22 is shorter in length than the intermediate portion 26 which in turn is shorter than the portion 24. Furthermore the block 20 has an upper side face and a lower side face which are generally indicated at 28 and 30, respectively, both of which have interlocking members indicated at 32 (Figure 2).

2

The embodiment indicated in Figures 1 to 5 is a preferred embodiment of the invention. As shown in Figure 3 the intermediate portion 26a projects above the tops of the outer portions 22 and 24 by a distance corresponding to that by which said outer portions project below said intermediate portion. By virtue of this fact, the upper side face 28 (Figure 2) and the lower side face 30 are provided respectively with a tongue and groove so as to permit interlocking of assembled blocks, as shown in Figure 2. This construction facilitates assembling of the blocks and eliminates straight passages through the blocks at their top and bottom sides when the blocks are stacked.

An interlocking means or hook 34 is provided at one end of the intermediate portion 26 and an interlocking means or hook 36 is provided at the opposite end, as shown in Figure 4. The several faces of both hooks are finished with precision in order to properly engage a corresponding hook on an adjacent block. The hooks 34 and 36 extend vertically between the upper side face 28 and the lower side face 30 which fact is more clearly shown in the projection views of Figure 5. In addition, the interlocking means or hook 34 opens in a longitudinal direction, while the interlocking means or hook 36 opens in a direction transverse to said block as shown in Figure 4.

Referring to Figure 4, it is to be noted that the several surfaces of the hooks 34 and 36 have corresponding dimensions. This is also true for the end surfaces adjacent said hooks. Because the outer portions 22 and 24 have equal thicknesses their end surfaces 40 and 38, respectively, are equal. In addition, the central portion 26a overlaps the outer portion 22 by a surface 44 which is equal to a surface 42 by which the outer portion 24 overlaps the intermediate portion 26a. By virtue of their design the surfaces 42 and 44 are equal to the end surfaces 38 and 40. A surface 46 extending perpendicularly from the surface 42 is equal to a surface 48, a surface 50 and a surface 52. It is due to these corresponding dimensions that the blocks may be joined to form a straight wall when like ends of two blocks are joined or a corner when unlike ends are joined. All of the blocks shown in Figure 1 have an identical configuration and the different structural combinations are achieved merely by choice of different ways of putting the blocks together.

Considering the block of Fig. 4 in detail it will be seen that the block therein disclosed has a first outer portion 24, a second outer portion 22, and an intermediate portion 26a. Portion 24 is longer than the intermediate portion 26a and the latter is longer than the second outer portion 22. End 38' of the portion 24 extends longitudinally beyond the end 40' of the second outer portion 22 by a distance equal to the transverse thickness of the block. The first end 38' also extends longitudinally beyond a first end 46 of the intermediate portion by a distance equal to the transverse thickness of the outer portion 24. At the opposite or second end of the block, the surface 38" of the portion 24 extends longitudinally beyond the surface 40" of portion 22 by a distance equal to the transverse thickness of the intermediate layer 26a. A first L-shaped slot has a leg 100 extending longitudinally toward the first end 46 of the intermediate portion and has a transverse inner wall 48 spaced longitudinally from surface 46 by a distance equal to the transverse thickness of the intermediate layer 26a. This slot leaves an L-shaped hook 36. At the opposite end of the block, a second slot 101 has a stem 102 extending longitudinally along an inner surface 50 of the portion 24. A leg 103 of this slot is directed transversely of the intermediate portion 26a, leaving a second L-shaped hook 34 capable of interfitting in slots of the type formed in the other end of the intermediate portion 26a as just described.

It is to be noted that these blocks may be employed to form either straight or corner constructions. The wall is straight when similar ends are disposed adjacent each other and cornered by placing unlike ends together. In the illustrated embodiment a wall may be constructed by the blocks without ancillary equipment.

Since certain changes can be made in the foregoing device and different steps may be employed in practicing the same, it is intended that all matter shown in the accompanying drawings and described hereinbefore will be interpreted as illustrative and not in a limiting sense.

What is claimed is:

1. A block comprising a body having a first and a second rectangular outer portion and an intermediate portion, said first outer portion being longer than the intermediate portion and the intermediate portion being longer than the second outer portion; a first end of said first outer portion extending longitudinally beyond a first end of said second outer portion by a distance equal to the transverse thickness of the block; said first end of the first outer portion extending longitudinally beyond a first end of said intermediate portion by a distance equal to the transverse thickness of said first outer portion; a second end of said first outer portion extending longitudinally beyond a second end of said second outer portion by a distance equal to the transverse thickness of the said intermediate portion; a first L-shaped slot extending laterally into the intermediate portion with the inner transverse wall of the stem of the slot spaced longitudinally from said first end of the intermediate portion by 30

a distance equal to the transverse thickness of the said intermediate portion and with the leg of the slot extending longitudinally towards the first end of said intermediate portion, said first slot leaving a first L-shaped hook at the first end of said intermediate portion; a second L-shaped slot having a stem extending longitudinally along an inner face of said first outer portion adjacent the second end thereof, said second slot having a leg directed transversely of the intermediate portion, said second slot leaving a second L-shaped hook at the second end of said intermediate portion, said first and second hooks having substantially the same cross-sectional shape as said slots for interfitting therewith.

2. A block as set forth in claim 1 wherein the transverse thicknesses of said first and second outer rectangular portions are equal.

References Cited in the file of this patent

UNITED STATES PATENTS

20	877,996	Henry	-----	Feb. 4, 1908
	1,652,743	Smith	-----	Dec. 13, 1927
	2,290,369	Fleischmann	-----	July 21, 1942

FOREIGN PATENTS

25	12,509	Great Britain	-----	1915
	84,402	Switzerland	-----	1920
	137,978	Great Britain	-----	1920
	200,583	Switzerland	-----	1939
	579,690	Great Britain	-----	1946