

Oct. 10, 1939.

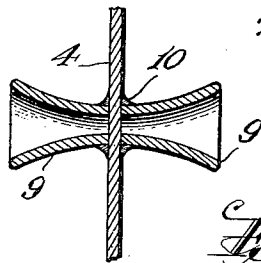
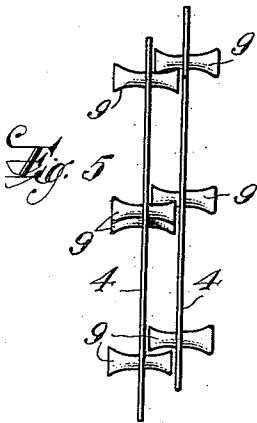
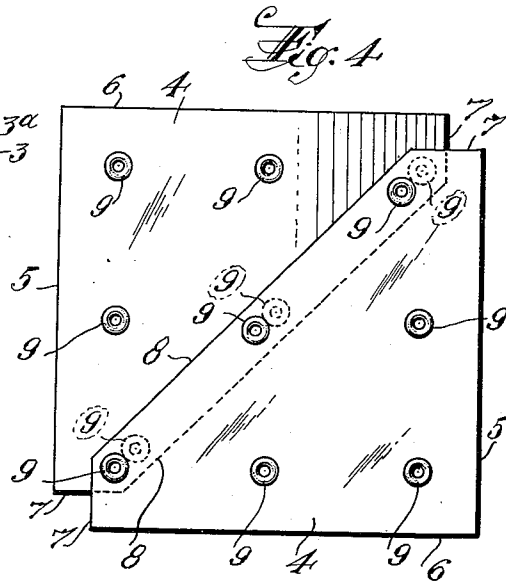
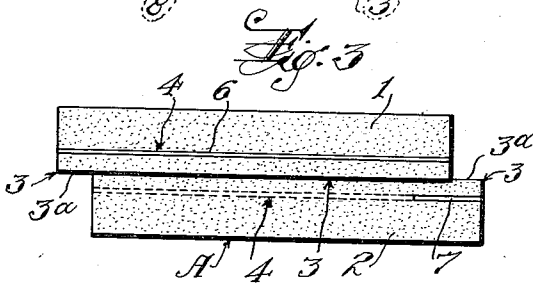
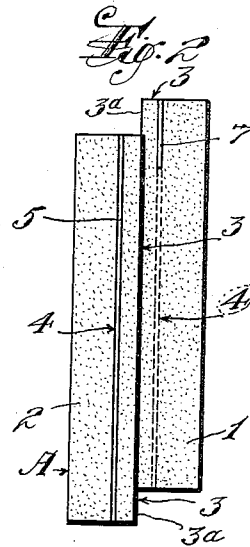
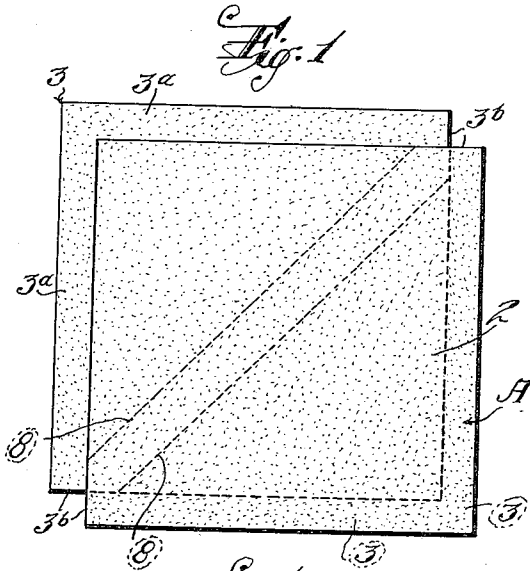
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2,175,671

LEAD-SHIELDED BUILDING BLOCK

Filed Nov. 12, 1938

2 Sheets-Sheet 1



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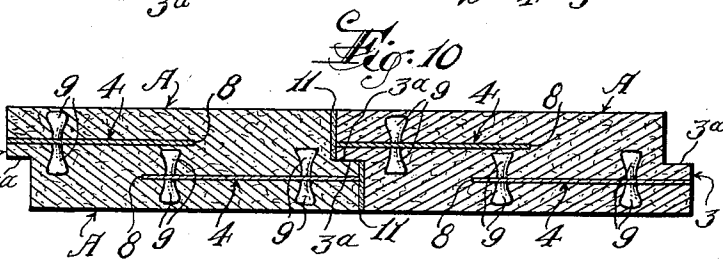
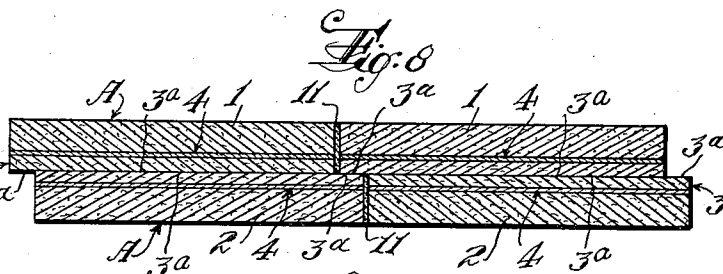
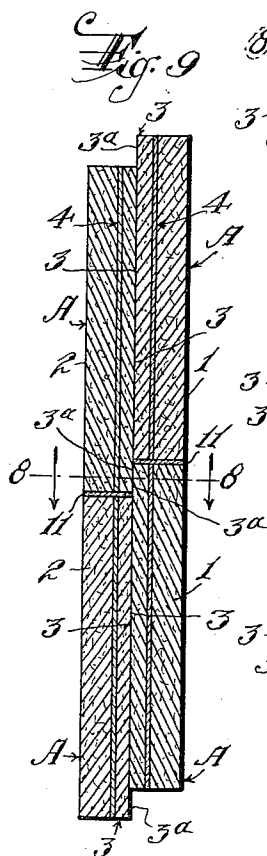
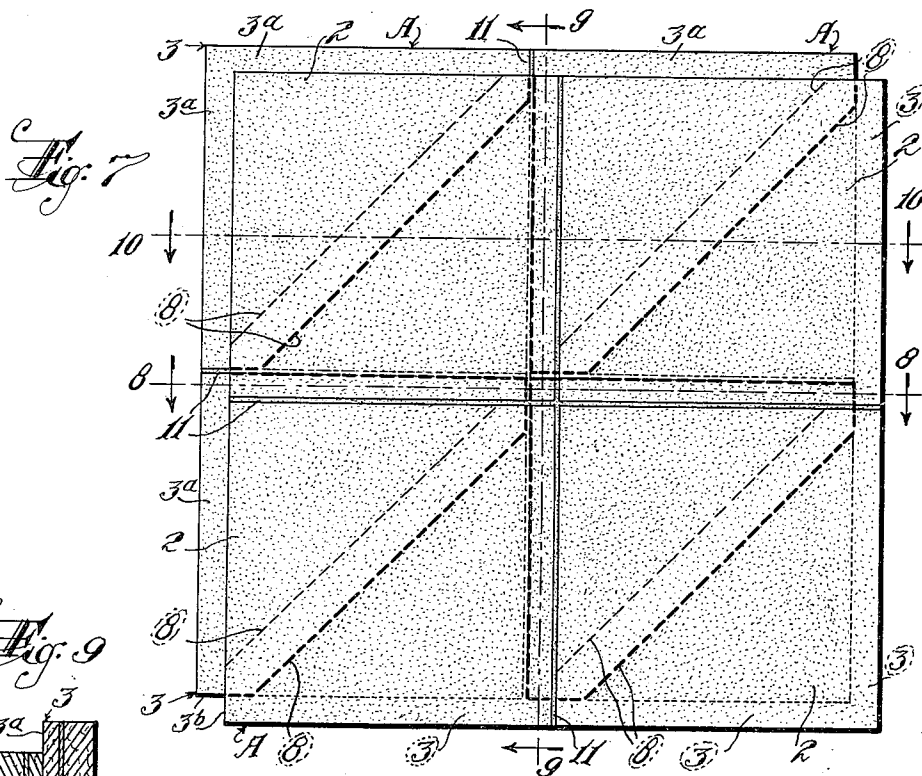
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LEAD-SHIELDED BUILDING BLOCK

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2 Sheets-Sheet 2



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LEAD-SHIELDED BUILDING BLOCK

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Application November 12, 1938, Serial No. 239,926

5 Claims. (Cl. 250—108)

This invention relates particularly to building blocks for use in walls, partitions, or floors of rooms wherein are used X-ray machines and the like, to prevent penetration of such walls, partitions, or floors by X-rays and the like projected from said machines.

One object of the invention is to provide a building block of this character comprising a novel and improved combination of suitable material such as cement, cinder composition, or specially prepared aggregate, such as "Pottasco" or "Haydite", and layers or sheets of ray-proof material such as lead, whereby the block shall be shielded throughout its face area against passage of X-rays or the like transversely through the block, and the layers of ray-proof material shall serve as reinforcements for the cement, cinder composition or the like.

Another object is to provide a building block of the character described which shall comprise a body of material such as cement, and a plurality of layers, sheets or plates of ray-proof material such as lead embedded in said body in parallel planes and spaced apart in the direction perpendicular to the general plane of the body with certain edge portions wholly disposed within the body and in overlapping relation to each other, whereby the material of the body surrounds and is disposed between said overlapping portions to form a monolith, other edge portions of the sheets being coincident with the edges of the body, so that said sheets shall shield the block throughout its face area against passage of X-rays or the like transversely through the block.

A further object is to provide such a building block wherein the sheets of ray-proof material shall be wholly embedded in the body of the block so that the block shall protect the sheets against injury during handling of the blocks.

Another object is to provide a ray-proof block which shall have a novel and improved construction, combination and arrangement of sheets of ray-proof material and flanges on the block to overlap flanges of similar blocks in erecting a wall, whereby the joints between adjoining blocks in a wall shall be thoroughly shielded against passage of X-rays therethrough.

Other objects are to provide novel and improved simple anchors or bonding ties on the ray-proof sheets to bond the sheets to the material of the body of the block and which will not detract from the ray-proof properties of the sheets; to provide a ray-proof block of the character described wherein the ray-proof sheets shall be formed of lead and shall be protected in a novel

and improved manner against galvanic action with the material of the body; and to obtain other results and advantages as will be brought out by the following description when read in conjunction with the accompanying drawings in which: 5

Figure 1 is a front elevational view of a building block embodying my invention.

Figure 2 is a side elevational view thereof.

Figure 3 is a top plan view thereof.

Figure 4 is a front elevational view of the lead-shield plates detached from the block. 10

Figure 5 is a side elevational view of the lead-shield plates.

Figure 6 is an enlarged fragmentary sectional view through one of the bonding elements for the plates. 15

Figure 7 is a front elevational view of a portion of a wall constructed with my building blocks.

Figure 8 is a horizontal sectional view on the line 8—8 of Figure 7. 20

Figure 9 is a vertical sectional view on the line 9—9 of Figure 7, and

Figure 10 is a horizontal sectional view on the line 10—10 of Figure 7. 25

Specifically describing the invention, my building block comprises a body A of suitable material such as cement, cinder composition, or specially prepared aggregate such as "Pottasco" or "Haydite". As shown, the block is approximately rectangular and in effect two identical rectangular sections 1 and 2 that are juxtaposed in parallel planes and disposed in diagonally offset relation, the portions of each section projecting beyond the other section forming flanges 3 35 whose faces 3^a preferably are in a common plane parallel to the general plane of the block, to overlap the flanges of a similar block in erecting a wall. The two sections 1 and 2 are integrally connected as by molding or casting, or may be otherwise connected together. 40

Described in another way, the block is shown as slab-like and approximately rectangular in shape with a flange at each side of two diagonally opposite corners of the block, the two flanges at the sides of one of said corners facing toward the front of the block and the two flanges at the sides of the other corner facing toward the rear of the block, each flange terminating short of the end of the flange at the adjacent side of the opposite corner of the block, as at 3^b. 50

Embedded in each of the sections 1 and 2 of the block is a sheet 4 of ray-proof material, for example lead, said sheets being disposed in parallel overlapping relation to each other so that the 55

block is shielded throughout its face area against passage of rays transversely through the block. As shown, each sheet 4 is approximately pentagonal, having two right angularly disposed edges 5 and 6 each of which is arranged coincident with one of the edges of one of the flanges 3 of one of the edges of the projecting portions of one of the sections 1 and 2. Each sheet also has other edges 7 which are disposed perpendicularly to the respective edges 5 and 6 and each arranged coincident with one of the other edges of one of the sections 1 and 2. Each sheet also has a diagonal edge 8 connecting the respective edges 7, and the sheets are arranged in the body of the block with the edge portions 8 of the sheets in overlapping relation as clearly shown in Figure 10. Figure 4 of the drawings shows the sheets detached from the body of the block and arranged in the same relation in which they are disposed within the block.

With this construction, it will be observed that each of the layers or sheets 4 of ray-proof material has a face area substantially less than the face area of the body and said layers complement each other so that together or complementally they underlie the whole face area of the block, whereby each unit of face area of the face of the block, including the flanges 3, is underlaid by a portion of one of the ray-proof sheets 4, and the block is shielded throughout its face area against passage of rays transversely through the block.

It will also be observed that the material of the block is disposed around and between the overlapping portions of the ray-proof sheets 4 so that the block is monolithic and the sheets serve as strong reinforcements for the block.

To provide an effective bond between the sheets 4 and the block, the sheets may have suitable bonding ties 9 secured to their faces and embedded in the material of which the block is formed, said ties projecting from the juxtaposed sides of the sheets and extending transversely through the portions of the body between the overlapping portions of the sheets. When the sheets 4 are formed of lead, as is usual, the bonding ties 9 will also be formed of lead; and preferably the bonding ties will be welded as at 10 to the respective sheets 4 to reduce to the minimum the possibility of galvanic action or corrosion at the connection of the bonding ties with the sheets.

To reduce to the minimum the possibility of corrosion or galvanic action between the sheets, bonding ties and the material of which the block is formed, preferably the sheets and bonding ties are coated with a suitable composition, such as aluminum paint or asphalt, before the sheets are embedded in the concrete, cinder composition or other material of which the block is to be formed.

Preferably the bonding ties 9 are wedge-shaped or tapered or have portions of their surfaces disposed at acute angles or in opposed relation to the corresponding surfaces of the sheets, as shown in Figure 6, so that the bonding ties restrain relative movement of the sheets and the block in directions both in planes parallel to the planes of the sheets and perpendicular to the planes of the sheets. Also, the bonding ties project from the sheets across the common plane of the flanges 3 or the plane of juncture of the two sections 1 and 2 of the block, so as to reinforce the block against transverse strains that may be exerted thereon through engagement with adjacent blocks in a wall.

In order to provide effective bonding between the various blocks of the wall, half blocks, that

is, blocks of half the size of those illustrated in the drawings, will be utilized at the proper points so as to stagger the joints between the blocks.

It will also be observed that all portions of the ray-proof sheets 4 are embedded in the block so that the block will effectually protect the sheets against injury during handling of the blocks. This is highly important because damage to the sheets might destroy or detrimentally affect the ray-proof properties of the block.

In erecting a wall with my blocks, the blocks are disposed in edge-wise superposed relation as shown in Figures 7 to 10 inclusive, with the flanges 3 of one block in overlapping and abutting relation to the flanges 3 of the adjacent blocks. Preferably mortar or other suitable material 11 is disposed between the abutting blocks. It will be observed that when the blocks are so erected, the joints between the blocks are thoroughly shielded by the ray-proof sheets 4 so as to prevent the passage of rays transversely through the joints. For clearness in illustration in Figure 7, the concealed edges of the two sheets 4 in each block are shown by dotted lines of different weight. The overlapping portions of the ray-proof sheets of adjoining blocks are clearly illustrated in the sectional views, Figures 8, 9 and 10. From these views and the foregoing description, it will be observed that a wall constructed of my building blocks will be completely shielded throughout its face area against passage of X-rays or other rays transversely through the wall.

It will be understood by those skilled in the art that the shape of the blocks and the shape and relationship of the ray-proof sheets, may be widely modified and changed without departing from the spirit or scope of the invention.

Having thus described my invention, what I claim is:

1. A building block comprising a molded body and a plurality of layers or ray-proof material embedded in said body and spaced apart in the direction of the thickness of the body and each having a face area substantially less than the face area of the body, one edge of each layer extending through and being coincident with each of certain edges of the body while the other portions of said layers are disposed within the body in overlapping relation to each other, said layers together underlying the whole face area of the block, and the molded material at opposite sides of and between said layers being monolithic, so that the block is shielded throughout its face area against passage of X-rays transversely there through.

2. A building block comprising a molded approximately rectangular slab-like body having a flange at each of two adjoining edges facing the front of the body, and a flange at each of the other two edges facing the rear of the body, and two sheets of ray-proof material embedded in said body and spaced apart in the direction perpendicular to the general plane of the body, one of said sheets having certain edges extending through and coincident with the edges of the first mentioned two flanges while the other sheet has certain edges extending through and coincident with the edges of the second-mentioned two flanges, and the other edges of said sheets extending diagonally of the body and being wholly disposed within the body and in overlapping relation to each other, whereby the portions of said body at opposite sides of and between said sheet

are monolithic and said sheets shield the block throughout its face area against passage of X-rays transversely therethrough.

3. A building block comprising two identical rectangular integrally molded sections juxtaposed in parallel planes and disposed in diagonally offset relation, the portions of each section projecting beyond the other section forming flanges to overlap the flanges of a similar block in erecting a wall, and a sheet of ray-proof material wholly embedded in each section, each of said sheets having a face area substantially less than the face area of the block, said sheets being arranged in spaced juxtaposed partially overlapping relation to each other and complementally underlying the whole face area of the block, and the molded material at opposite sides of and between said sheets being monolithic, whereby the block is

shielded throughout its face area against passage of rays transversely of the block.

4. The building block set forth in claim 1, with the addition of bonding ties secured to and projecting from the juxtaposed sides of the layers and extending transversely of the portions of the body that are disposed between the overlapping portions of said layers, said ties having surfaces disposed in opposed relation to the planes of the layers.

5. The building block set forth in claim 3, with the addition of bonding ties welded to the side of each sheet that is juxtaposed to the other sheet and extending transversely of the body between said sheets, said ties having surfaces disposed in opposed relation to the planes of the sheets.

JOHN J. RYAN.