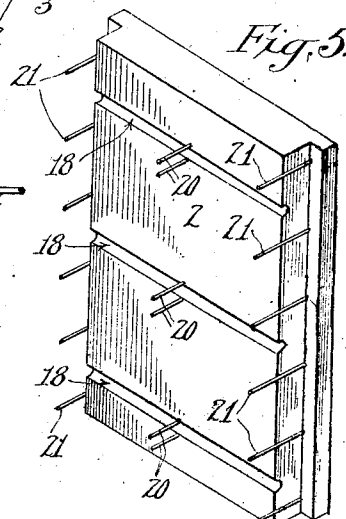
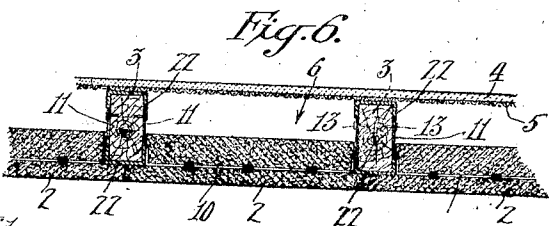
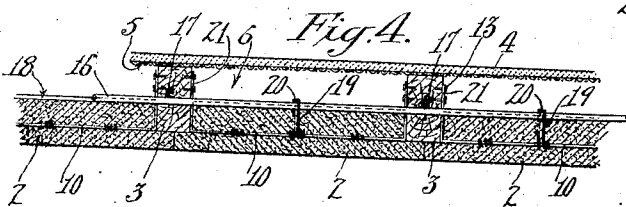
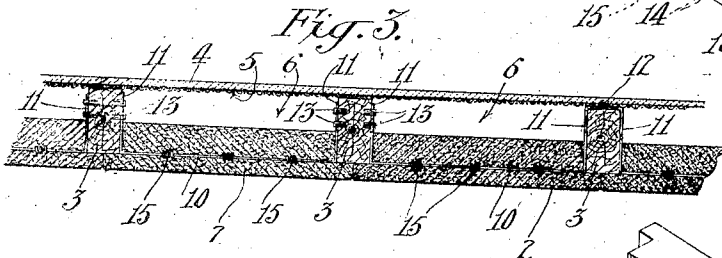
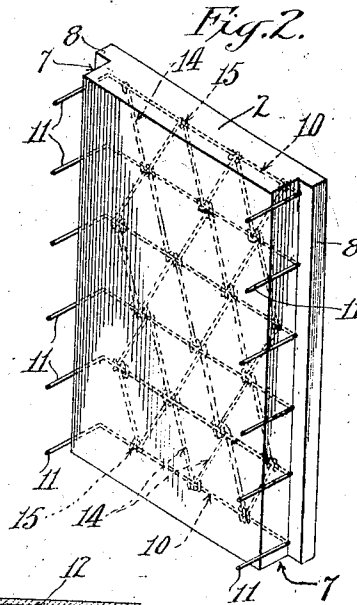
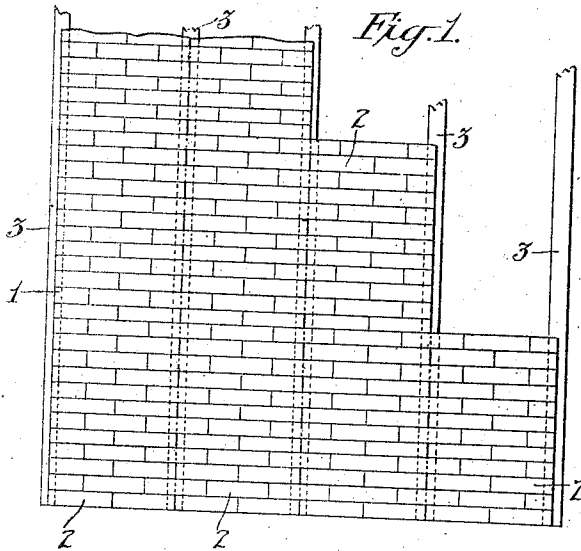


J. E. MacKAY.
STRUCTURE AND MEANS FOR FORMING THE SAME.
APPLICATION FILED AUG. 10, 1908.

1,053,415.

Patented Feb. 18, 1913.

2 SHEETS-SHEET 1.



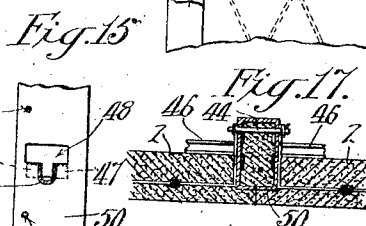
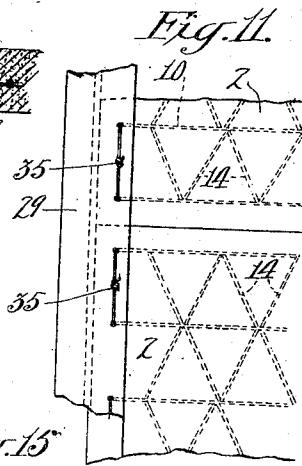
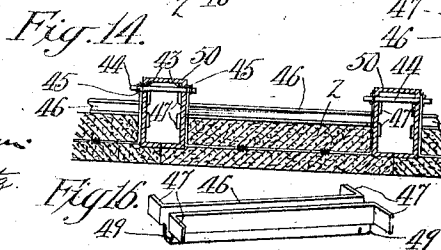
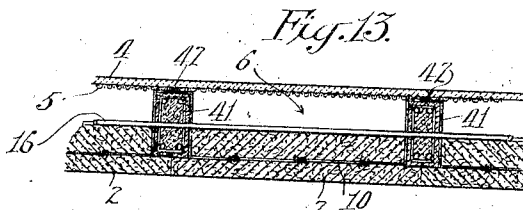
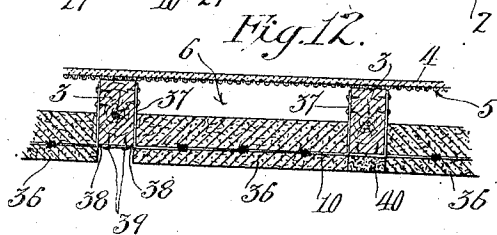
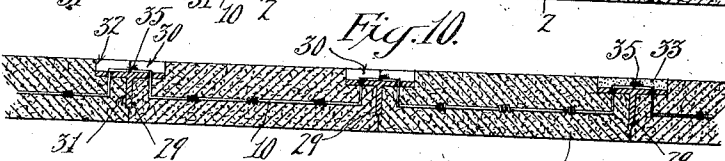
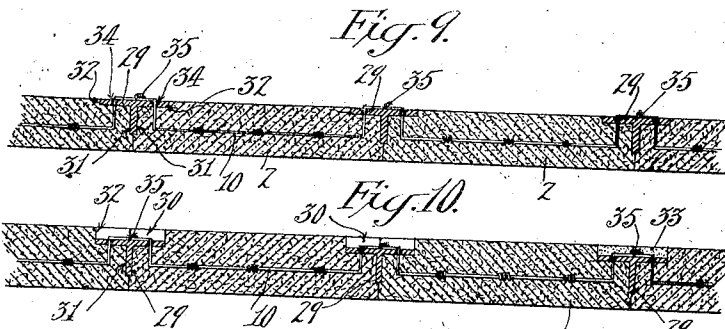
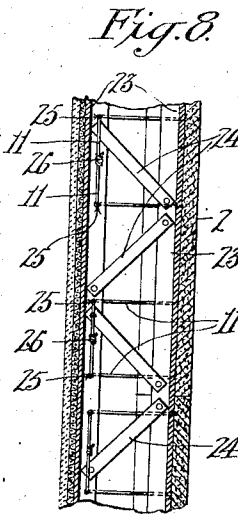
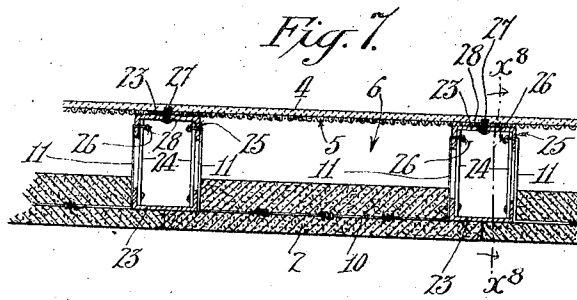
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 2 SHEETS—SHEET 2.



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Patented Feb. 18, 1913.

UNITED STATES PATENT OFFICE.

JOSEPH E. MacKAY, OF LOS ANGELES, CALIFORNIA.

STRUCTURE AND MEANS FOR FORMING THE SAME.

1,053,415.

Specification of Letters Patent.

Patented Feb. 18, 1913.

Application filed August 10, 1908. Serial No. 447,906.

To all whom it may concern:

Be it known that I, JOSEPH E. MacKAY, a citizen of the United States of America, residing in Los Angeles, in the county of Los Angeles and State of California, have invented new and useful Improvements in Structures and Means for Forming the Same, of which the following is a specification.

This invention relates to building or architectural structures and particularly to means for forming a composite structure with concrete or similar blocks secured to studding.

The main object of the present invention is to provide means for securing such blocks to the studding in an efficient and economical manner.

A further object of the invention is to provide means for bracing the walls of such a structure.

The accompanying drawings illustrate an embodiment of the invention and form a part of the specification.

Figure 1 is a broken elevation of the side of a building partly built in accordance with my invention. Fig. 2 is a perspective view looking at the inner side of one form of block used in constructing the same. Fig. 3 is a transverse, horizontal, sectional view of a portion of said wall. Fig. 4 is a transverse, horizontal, sectional view of a different form of the wall. Fig. 5 is a perspective view looking at the inner side of the form of block used in building the wall shown in Fig. 4. Fig. 6 is a transverse, horizontal, sectional view of a wall showing the studding reinforced by channel irons. Fig. 7 is a transverse, horizontal, sectional view of a portion of a wall showing the studding formed from a hollow metal structure. Fig. 8 is a transverse, vertical, sectional view of said wall taken on the line x^8-x^8 of Fig. 7. Figs. 9 and 10 are transverse, horizontal, sectional views of walls having vertically arranged T irons for studding. Fig. 11 is a broken elevation of the structure shown in Fig. 9. Fig. 12 is a transverse, horizontal, sectional view of a wall showing differently formed blocks and the means for securing them in position. Fig. 13 is a transverse, horizontal, sectional view of a wall in which the studding is formed from reinforced concrete. Fig. 14 is a similar view in which the studding is formed from hollow tubular members showing a different method of se-

curing the building blocks thereto and also braces between the studding. Fig. 15 is a broken side elevation of one of said studding with a brace shown in section. Fig. 16 is a perspective view of one of said braces. Fig. 17 shows a portion of the wall of Fig. 14 with the studding filled with concrete.

Referring more particularly to the drawings which are for illustrative purposes only and, therefore, are not drawn to any particular scale, 1 indicates the wall of a building which may be of any desired contour or outline and is formed from blocks 2 which are secured to the vertically arranged studding 3. As shown in Fig. 3 of the drawings the wall is formed or provided upon its inner face with the usual plastering or coating 4 secured to the lathing or support 5. The outer wall or facing which is formed from the blocks of material hereinafter to be more particularly described is located at such a distance from the inner portion of the wall as to leave dead air spaces 6 which preferably extend from the bottom to the top of the wall.

The preferred form of building block 2 as shown in Figs. 2 and 5 comprises a slab-like structure of any desired dimensions as to length, breadth and thickness, and is preferably provided along each of two of its edges with a recess 7 which thereby forms a flange 8 upon each of said edges. Embedded in the block which is preferably formed from cement in the usual manner and flush with the inner face of the flange 8 is a series of body wires 10 which extend from one recessed edge to the other as shown more particularly in Fig. 2, and each rod or wire is long enough to project inwardly a suitable distance beyond the edges of the block as shown at 11. The wires 10 are preferably located in the block substantially even with the bottom of the recesses 7 so that their projecting ends will normally extend past the flanges 8 the desired distance and are adapted to be bent up at an angle to the plane of the block so as to rest against or stand adjacent to one of the walls of the recess in position for having its projecting portion engage with the studding, as by being twisted together around it as shown at 12 in Fig. 3, or be secured thereto, as by pins or staples 13. The intermediate or embedded portions of the wires 10 are interconnected or bound together by crossed diagonally arranged strands of wire 14 which are secured to said

wires 10, as by being coiled around the same as shown at 15 providing a wire cloth reinforcement for the block. The width of the flanges 8 may be of any desired thickness, but the length or projecting portion of it is preferably substantially half the width of the studding to which the blocks are to be secured, so that when said blocks are placed against the studding the adjacent flanges of the blocks upon opposite sides of the studding will abut against each other or be so close to each other as to present a smooth and substantially unbroken surface as shown in Figs. 1 and 3. The thickness of the building block is such that when the block is set into position with its flanges engaging with the outer surface of the studding its inner face will be at a sufficient distance from the inner facing or wall as to form a dead air space therebetween. As an additional means for securing the block against the studding a rod or bar 16 is preferably secured to the studding, as by forming perforations 17 therein through which the bars 16 can be threaded. The perforations 17 and the rods 16 are so related relatively to the outer face of the studding that when the blocks 2, as shown more particularly in Fig. 5, are placed in position against the studding the bars 16 will be seated in rod-grooves or recesses 18 formed upon the inner face of the blocks 17. Additional fastening means, as wires 19, are embedded in the blocks, coiled around their respective body wires 10 and project from the inner face of the block adjacent to the sides of the grooves or channels 18 so as to have their ends twisted around the rod 16 as shown at 20. In this form the projecting ends 21 of the body wires embedded in the block are bent up against one of the walls of the recess formed in each edge of the block and are secured to or connected with the studding in the same manner as heretofore described.

In Fig. 6 the studding is shown as being partially inclosed or incased in the strips of channel iron 22 which are adapted to have the outer and inner faces of the wall secured to or connected therewith in the same manner as heretofore described for the other forms of studding. The projecting ends of the retaining wires are secured to the studding by the pins or staples 13 which are driven into the studding between the adjacent edges of the channel irons 22.

In Figs. 7 and 8 a studding is shown as being formed from vertically arranged channel irons 23 and diagonally arranged braces 24 which are secured to the flanges thereof in the well-known manner of riving, thereby forming a very light but strong and durable hollow studding. In this form the ends of the retaining wires of the building blocks are preferably passed through perforation 25 in the flanges of the inner iron

and secured in any manner, as by being twisted together as shown at 26. The inner wall or facing is secured to said inner channel iron in any suitable manner, as by means of fasteners 27 projecting through perforations 28.

In the forms of wall shown in Figs. 9, 10 and 11 the studding is formed from T beams 29. In this structure, which is preferably used for low structures, as shops, &c., where a thick, heavy wall is not necessary, the heads of the beams are preferably placed inward either substantially even or flush with the inner face of the wall as shown in Fig. 9, or at a greater or less depth from the same as shown at 30 in Fig. 10. In this form of wall each of the building blocks is provided with two recesses 31 and 32 upon its inner edge, one of which is for the reception of the rib of the beam, and the other for one side or portion of the head or main portion, the recess 32 being deeper in the form shown in Fig. 10 than it is in Fig. 9 for the purpose of forming the recess 30 in the wall, said recess 30 being preferably filled by cement or other suitable material as shown at 33 in Fig. 10. This structure also necessitates the bending of the retaining wires at a distance from the recesses 31 and causing them to project from the bottom of the recess 32 in position for being passed through the perforations 34 in the head or flat portion of the beams and secured in position, as by twisting their ends together as shown at 35.

In the form of wall shown in Fig. 12 the blocks 36 are formed without the recesses or flanges at the edges, and the retaining wires project therefrom at a suitable distance from the outer surface. Some of the wires are bent up against the edge of the block as shown at 37 similar to the flanged blocks as heretofore described, and are secured to the studding in the same manner, and the other wires extend in a straight line across the face of the studding as shown at 38 and are secured thereto, as by means of pins or staples 39. After the wall has been completed in this manner the space between the blocks at the outer face of the studding is filled in any suitable manner, as by concrete 40 similar to the filling 33 shown in Fig. 10.

In the form of structure shown in Fig. 13 the studding 41 is formed from concrete and the ends of the retaining wires are preferably extended to the inner sides thereof and twisted together as shown at 42 in the manner heretofore described.

In the structure shown in Fig. 14 the studding is of tubular form with perforations 43 made in its walls through which a rod or pin 44 is passed with its ends projecting far enough beyond the walls of the studding for the engagement therewith of

the ends of the retaining wires, as by wrapping them around the same as shown at 45. In this form horizontal braces 46 are provided for adding greater strength and rigidity to the wall in its own plane. These braces are each preferably trough shaped in cross section and provided at each end with wings 47 which are bent laterally for engaging with the inner side of the studding after the end of the brace has been projected through a perforation 48 in the side of the studding. The perforation is substantially T shaped with the width across the stem or narrow portion only wide enough to fit the end of the brace so that after the wings have been passed through the top or wider portion and dropped down a shoulder 49 formed by cutting away the bottom of the brace will engage with the studding on the outside of its wall or side and the wings will engage with the inside, thereby making a very strong and rigid construction. When desired, the studding can be filled with cement after the braces have been placed in position which will further add to the strength and rigidity of the parts and will also lock the braces against removal.

In constructing a building as above described, the frame work is first erected, or so much of it as may be necessary to hold the studding in its desired position. A single layer of individual blocks is then placed upon the outside of the studding with the blocks set upon edge and secured to each other and to the studding by means of mortar or cement in the usual manner, and the ends of the retaining wires are then secured to the studding by any of the means above set forth. After the frame work and outer wall of the structure have been completed in this manner the inner facing or wall is applied to or secured upon the inner faces of the studding in any desired manner. In this manner a very cheap, strong and durable structure is quickly secured which is provided with dead air spaces extending from the bottom to the top of the wall, which will contribute to the comfort of the occupants of the building, as will be well understood, by securing a warmer building in cool weather and a cooler building in warm weather.

The blocks from which the building is constructed can be readily molded or pressed into the desired shape in any suitable manner with the retaining wires and reinforcing material embedded therein during the process of such formation, and by providing such strong securing means for attaching them to the studding only one thickness of block is required, as all that is necessary is to place the blocks upon edge between the studding and rigidly hold them in that position by means of the projecting retaining wires. The mortar or concrete which is

placed between the edges of the blocks and also between them and the studding will thereby form a substantially continuous wall with vertically arranged recesses upon its inner face within which the studding is located. Each stud is set or arranged with its thicker or stronger portions set transversely to the wall so as to keep the wall from bulging outward, the flat sides co-acting with the shoulders or sides of the recesses in the inner face of the wall to hold the blocks against moving within the plane of the wall.

By the term studding I wish it to be understood that I use it in its broadest sense as including joists or other framing of a building to which my invention is applicable—studs or joists collectively.

Having described my invention, I claim:

1. A building block formed with recessed edges adapted to be secured between the sides of studding and providing flanges adapted to lap the studding and having wires embedded in the body thereof and extending therethrough from edge to edge and through the edges and bent inwardly in the recessed edges in front of the flanges, lapping the edges and projecting beyond the inner face of the body and adapted to be secured to the sides of studding and diagonally arranged wires crossed and coiled around the body wires at their meeting points and extending to the edges of the block.

2. A building block constructed with studding recesses in the opposite edges thereof adapted to receive the studding and providing flanges adapted to overlap the studding, and with wires embedded in the body thereof and extending therethrough from edge to edge and through the edges in front of the inner faces of the flanges and bent inwardly, lapping the edges, and projecting beyond the inner face of the body and adapted to be secured to the sides of studding and diagonally arranged wires crossed and coiled around the body wires at their meeting points and extending to the edges of the block.

3. A building block constructed with studding recesses in the opposite edges thereof adapted to receive the studding and providing flanges adapted to overlap the studding and with wires embedded in the body thereof and extending therethrough from edge to edge and through the edges flush with the inner corners of the studding recesses in front of the inner faces of the flanges and bent inwardly, lapping the edges, and projecting beyond the inner face of the body and adapted to be secured to the sides of studding and diagonally arranged wires crossed and coiled around the body wires at their meeting points and extending to the edges of the block.

4. A building block adapted to be secured between the sides of studding, formed with rod-grooves in the inner face thereof, and having wires embedded in the body thereof in rear of the rod-grooves and extending from edge to edge and through the edges, and transverse wires coiled around the body wires and having their ends extending across the rod-grooves and beyond the inner face of the body.

5. A building block having wires embedded in the body thereof and extending therethrough from edge to edge and therebeyond and bent inwardly and projecting beyond the inner face of the body and adapted to secure the studding against the edges of the body, and constructed with rod-grooves in the inner face of the body in front of the body wires and transverse wires secured to the body wires and having their ends extending across the rod-grooves and beyond the inner face of the body.

6. A structure comprising studding and building blocks located between the studding, each block formed with recessed edges providing flanges lapping the studding and having wires embedded in the body thereof and extending therethrough from edge to edge and through the edges and bent inwardly in the recessed edges in front of the flanges, lapping the edges, and projecting beyond the inner face of the body between the edges thereof and the studding and secured to the sides of the studding and diagonally arranged wires crossed and coiled around the body wires at their meeting points and extending to the edges of the block.

7. A structure comprising studding hav-

ing transverse perforations and building blocks located between the studding each block having wires embedded in the body thereof and extending therethrough and constructed with rod-grooves in the inner face of the body in front of the body wires, transverse wires secured to the body wires and having their ends extending across the rod-grooves and beyond the inner face of the body and rods threaded through the transverse perforations of the studding occupying the rod-grooves and secured by the transverse wires.

8. A structure comprising studding having transverse perforations and building blocks located between the studding each block having wires embedded in the body thereof and extending therethrough from edge to edge and therebeyond and bent inwardly and projecting beyond the inner face of the body between the edges thereof and the studding and secured to the studding and constructed with rod-grooves in the inner face of the body in front of the body wires, transverse wires secured to the body wires and having their ends extending across the troughs and beyond the inner faces of the body and rods threaded through the transverse perforations of the studding occupying the rod-grooves and secured by the transverse wires.

In testimony whereof, I have hereunto set my hand at Los Angeles, California, this 31 day of July 1908.

JOSEPH E. MACKAY.

In presence of—

W. S. BOYD,

FRANK L. A. GRAHAM.