March 22, 1938. F. M. HUGHSON 2,111,562

WALL CONSTRUCTION AND COLLAPSIBLE MOLD

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Fig. 1.

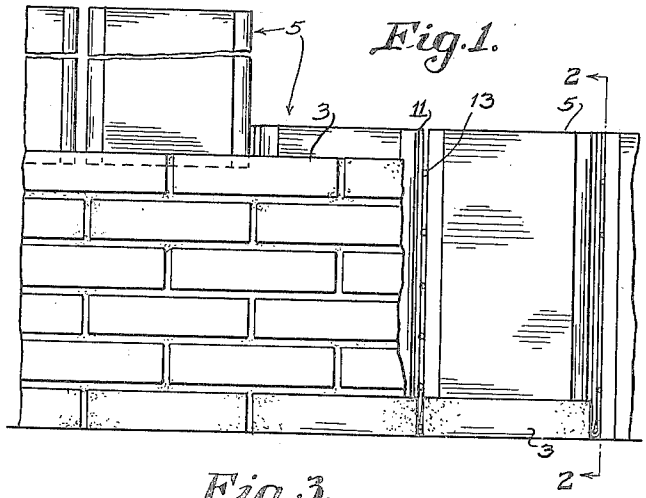


Fig. 2.

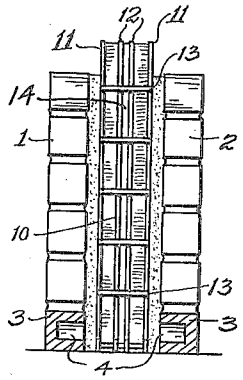


Fig. 3.

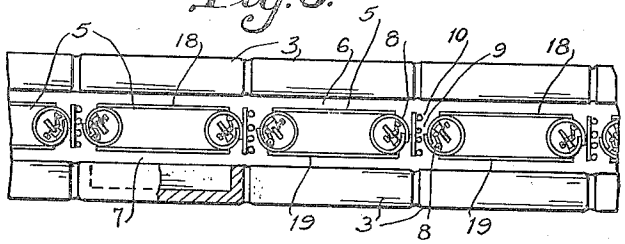
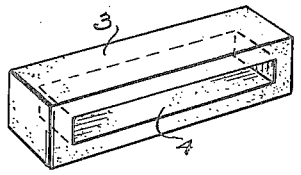


Fig. 7.



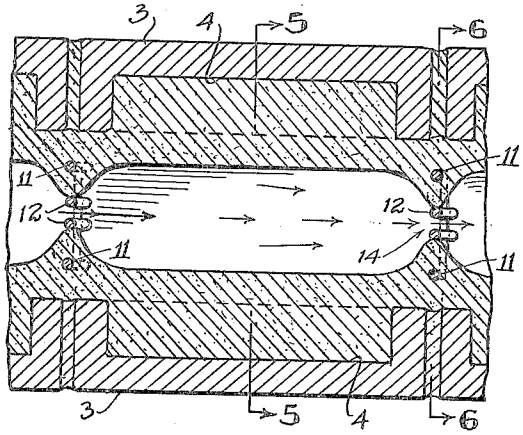


Fig. 4.

Fig. 5.

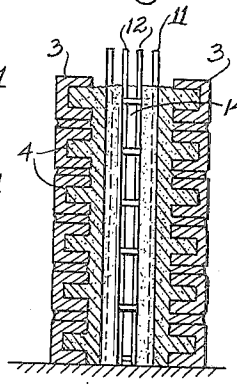
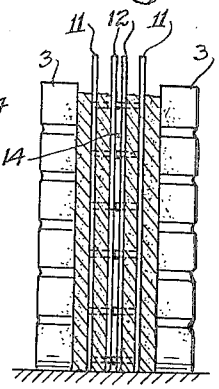


Fig. 6.



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Fig. 8

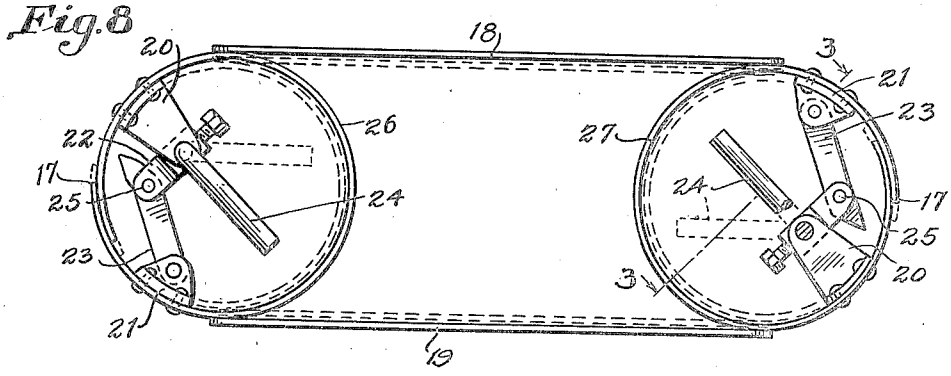


Fig. 9.

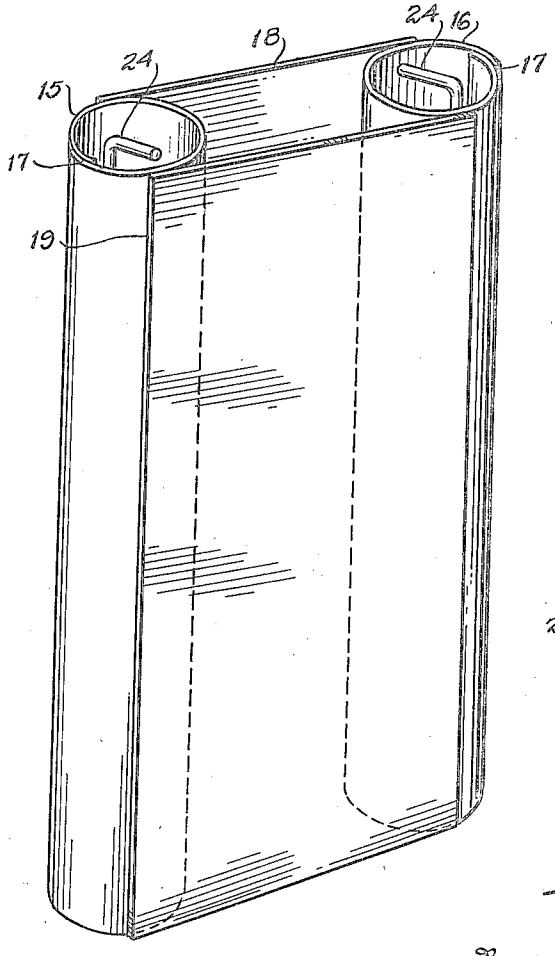
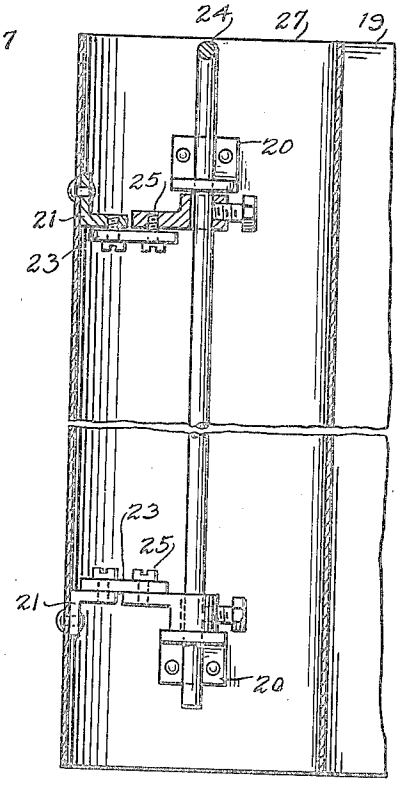


Fig. 10.



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Patented Mar. 22, 1938 2,111,562

UNITED STATES PATENT OFFICE

2,111,562

WALL CONSTRUCTION AND COLLAPSIBLE MOLD

Fred M. Hughson, Roanoke, Va., assignor to United Builders Company, Roanoke, Va.

Substitution of application Serial No. 530,696, April 16, 1931. This application October 26, 1936, Serial No. 107,699

5 Claims. (Cl. 25—128)

This invention relates to building construction and proposes a composite wall of that type in which inner and outer brick walls are provided, the units of which are unitarily bonded by a shell of concrete poured into the spaces between said brick walls and collapsible core molds arranged end to end between said walls, the poured concrete keying with transverse metallic reinforcement elements arranged between the ends of adjacent molds whereby the inner and outer brick walls are integrally bonded while at the same time a continuous air space is formed throughout the lateral extent of the composite wall, by the exclusion of the concrete from the narrow space defined between the ends of the molds and adjacent portions of the reinforcements. This is a substitute application for that originally filed April 16, 1931, Serial No. 530,696, originally allowed on January 25, 1934.

The object of the invention is to provide the core molds with oval or convergent ends between which the transverse reinforcement extends, the ends of said molds defining ribs on the poured concrete which inter-key with the marginal portions of the metallic reinforcement, bonding the inner and outer brick walls together.

Still another object of the invention is the construction of the collapsible molds per se.

In the drawings in which the same characters of reference have been used throughout the several figures to designate identical parts:

Figure 1 is a side elevation partly in section of the composite wall;

Figure 2 is a vertical section taken along the line 2—2 of Figure 1;

Figure 3 is a plan view, parts being shown in section;

Figure 4 is a horizontal section on an enlarged scale;

Figure 5 is a vertical section taken along the line 5—5 of Figure 4, scale being reduced;

Figure 6 is a section taken along the line 6—6 of Figure 4;

Figure 7 is a perspective view of one of the bricks;

Figure 8 is a plan view of the collapsible core mold;

Figure 9 is a perspective view of the same; and

Figure 10 is a section taken along the line 3—3 of Figure 8.

Referring now in detail to the several figures, and first adverting to the group including Figures 1 to 7, inclusive, the numerals 1 and 2 represent inner and outer walls of brick laid in courses in the manner as shown, the bricks having preferably the shape of the brick 3 shown in Figure 7 being formed on its inner face with a depression 4 acting both as a key-way for receiving the poured concrete and as a hand hold in assisting the mason in laying the bricks. On account of the provision of this hand hold, it is as easy to lay a large brick as a small brick of ordinary construction and consequently, the bricks made in accordance with the present invention may be made of considerably larger dimensions. In view of the amount of material saved by the presence of the key-way 4, a brick having twice the dimensions of an ordinary brick may be made and yet weigh no more. This means that twice as many can be laid in a given time and the cost of laying reduced by half.

The brick walls 1 and 2 are spaced apart sufficiently to accommodate between them a row of core molds 5 as shown in Figure 3, and in addition, to leave spaces 6 and 7 in front and to the rear of the core molds for the purpose of receiving poured concrete which enters into the key-ways 4 of the bricks and forms an integral shell unitarily bonding together the bricks in the inner and outer brick walls respectively.

The core molds are preferably formed with rounded ends 8 as shown, and brought into such adjacency that their ends almost abut forming generally wedge-shaped spaces 9 which extend inwardly from the brick walls and constitute molds for defining ribs on the poured concrete. Metallic reinforcing elements one of which is shown complete at 10 in Figure 2, are placed between the ends of adjacent core molds and held in position by said molds. Said reinforcing elements may be constructed in any suitable manner as desired, but in the present instance are shown as being formed by four vertical rods or wires, an outer pair 11 and an inner pair 12. These rods or wires are intersected by transverse rods or wires 13 which may be secured to the vertical wires in any desired manner as for instance, by welding.

In building a wall embodying the principles of the present invention, an inner and outer layer of bricks is laid, and the collapsible core molds 5 stood up in place with the reinforcing elements supported therebetween. The brick walls may then be continued to a height almost equal to the height of the molds 5, as shown in Figure 2. Concrete preferably having a fairly large aggregate is then poured into the intra-mural spaces 6 and 7 entering into the key-ways 4 as hereinbefore stated and filling the spaces 9 which define the ribs. The concrete fills in around the outer

pair of rods or wires 11 and inter-keys with them bonding the reinforcing element to the inner and outer walls. Since the inner pair of rods or wires block the ingress of the soft concrete to the narrower portions of the spaces formed between the ends of the molds 5, the concrete terminates at said rods or wires 12 leaving the space between said rods or wires vacant. The molds 5 are collapsible as will hereinafter be explained and when they are removed, the spaces 14 defined between the rods or wires 12 forms a permanent avenue of communication between the spaces vacated by the core molds. It is thus apparent that between each pair of core molds the inner and outer walls are integrally bonded by the metallic reinforcement and at the same time a continuous air space is determined extending throughout the entire lateral extent of the wall so that the concrete of the outer wall never comes into contact with the concrete of the inner wall. The provision of the continuous air space provides a complete temperature and moisture insulation between outer and inner walls, and it is obvious that the heating plant of a building provided with walls of this type may be arranged within this air space so as to heat the same.

In Figures 8, 9 and 10, the collapsible molds are shown in detail. This comprises a pair of spaced spirally wound metallic cylinders 15 and 16, each having an open joint 17, the open joints being disposed outwardly at the ends of the mold. At diametrically opposite points transversely of the mold, flat plates 18 and 19 are soldered, riveted or otherwise rigidly secured to the spiral cylinders. Expanding and contracting mechanism is provided for the spiral cylinders, comprising lugs 20 and 21 secured on the inside of each cylinder at opposite sides of the open joint. Said lugs are connected by a pivoted toggle including the links 22 and 23 and an operating handle 24 fixed to one of said links. The elements 20 to 23 are duplicated at opposite ends of each spiral cylinder and the operating handle 24 extends through from one set of expanding and contracting elements to the other. Each of the spiral cylinders is provided with similar operating mechanism. When the handles 24 are turned so as to break the toggle, the sides of the open joint are drawn together and the diameter of the spiral cylinders reduced. This draws in the flat plates 18 and 19 as well as the ends of the mold. When the operating handles 24 are moved so as to spread the toggle, the spiral cylinders are expanded, and the sides 18 and 19 as well as the ends of the molds forced outwardly. The toggle is so constructed that in the extreme expanding movement of the handles 24, the pivot 25 of the toggle slips past dead center locking the spiral cylinders in expanded position. In using the collapsible core molds in building a wall, after one layer of the wall is set the molds are contracted and raised to such height that their lower ends remain just within the tops of the spaces from which they have been withdrawn. The molds are then expanded so as to lock them in position with their lower ends frictionally engaged with the upper edges of the core holes. A second layer of wall is then built upon the first layer.

It is known to be old to provide a collapsible mold for concrete construction and particularly the construction of pipes, comprising a spiral cylinder expanded and contracted by means equivalent of the means herein shown.

It is believed to be entirely new however, to spread and contract the width of an elongated mold having flat sides by the simple expansion and contraction of the spiral cylinders. This approach and recession of the flat parallel sides, is accomplished through the bowed portions 26 and 27 of the spiral cylinders, to the ends of which bowed portions the flat plates 18 and 19 are fixed. When the spiral cylinders are contracted, the bowed portions diminish in diameter, drawing in the flat sides of the mold. The converse happens when the spiral cylinders are expanded.

What I claim is:

1. Core mold for poured concrete construction comprising spaced cylindrical members each having an open lapping joint facing outwardly, plates fixed to the opposite sides of said cylindrical members, and means for contracting the diameter of said cylindrical members for drawing said plates toward one another.

2. Core mold for poured concrete construction comprising spaced cylindrical members, each having a longitudinal open lapping joint facing outwardly, plates bridging the distance between said cylindrical members and secured longitudinally thereto on opposite sides forming an enclosure, the portions of said cylindrical members within said enclosure serving as variable spacing members for said plates, and means for contracting the diameter of said cylindrical members for drawing said plates toward one another.

3. Core mold for poured concrete construction as claimed in claim 2, the contracting means comprising a toggle for each cylindrical member, within said member and anchored thereto on opposite sides of the lapping joint.

4. Core mold for poured concrete construction, as claimed in claim 2, the contracting means comprising toggles arranged adjacent the opposite ends of each cylindrical member and within said member, the ends of said toggles being anchored to the walls of said cylindrical members at opposite sides of the lapping joint, and an operating connection for the toggles in each cylindrical member.

5. Core mold for poured concrete construction as claimed in claim 2, the contracting means comprising toggles at the opposite ends of said cylindrical members and within said members, the ends of said toggles being anchored to the walls of said cylindrical members at opposite sides of the lapping joints, said toggles being arranged to move past dead center in the expanding movement, for locking said mold in expanded position.

FRED M. HUGHSON.