A. G. DRAKE.

CORE FOR CONSTRUCTING HOLLOW CONCRETE WALLS.

APPLICATION FILED NOV. 16, 1911.

1,045,824.

Patented Dec. 3, 1912.

2 SHEETS—SHEET 1.

FIG. 1.

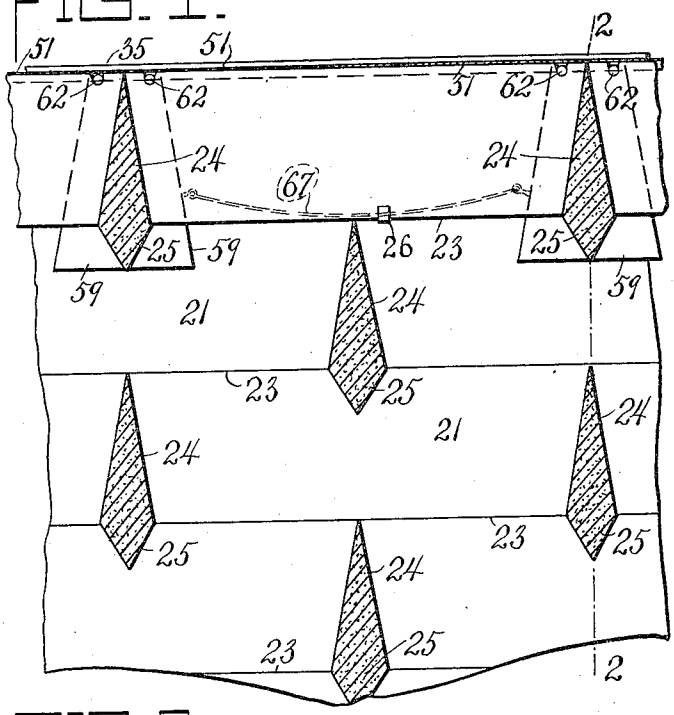


FIG. 2.

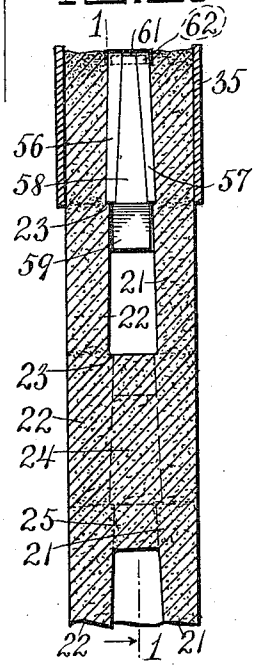


FIG. 3.

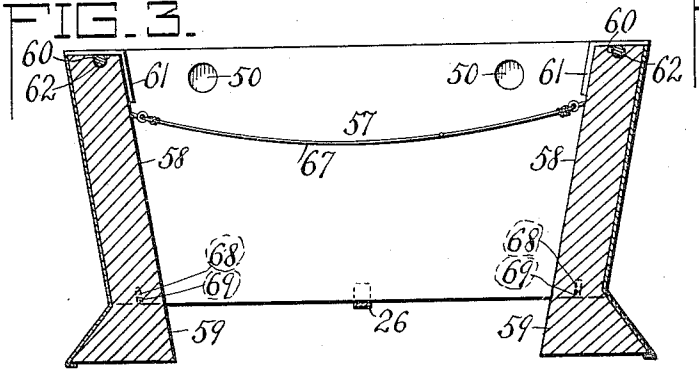


FIG. 4.

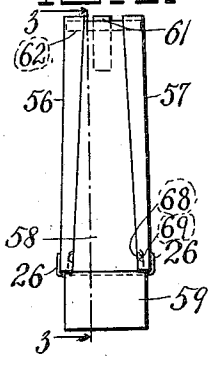


FIG. 5.

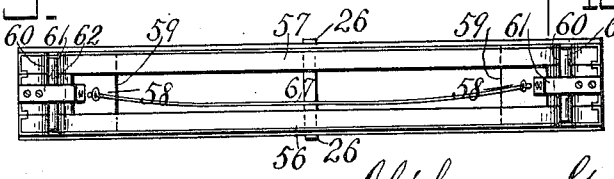
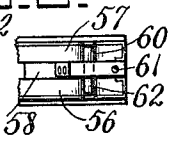


FIG. 6.



WITNESSES

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2 SHEETS—SHEET 2.

FIG. 7.

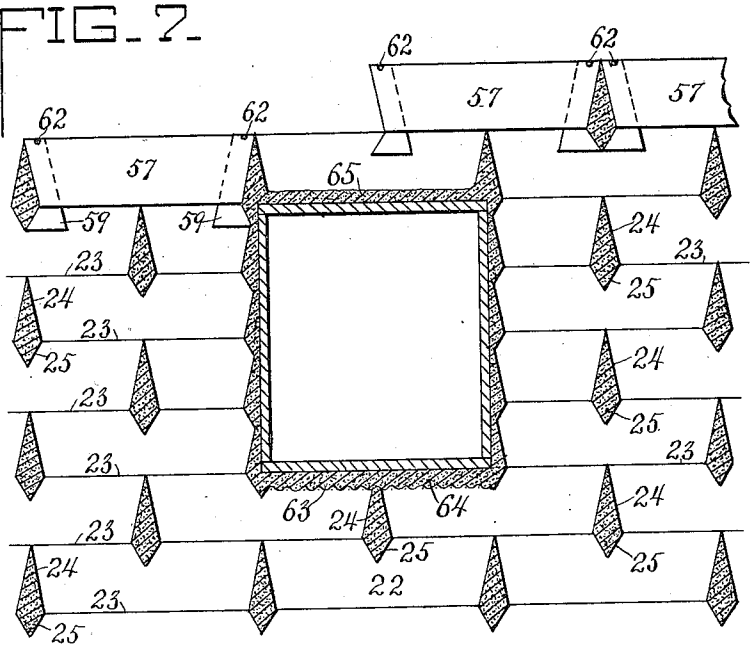

FIG. 8.

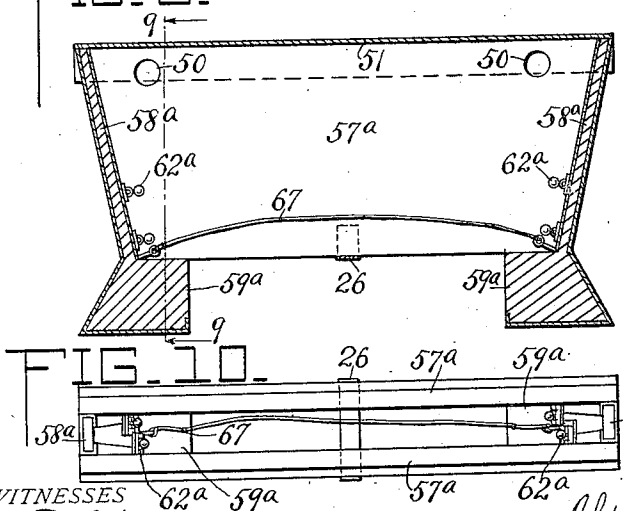

FIG. 9.

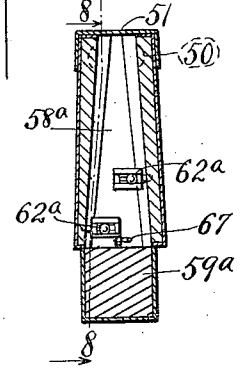

FIG. 10.

WITNESSES

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CORE FOR CONSTRUCTING HOLLOW CONCRETE WALLS.

1,045,824. Specification of Letters Patent. Patented Dec. 3, 1912.

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To all whom it may concern:

Be it known that I, ALPHONSO G. DRAKE, a citizen of the United States of America, and a resident of Washington, in the District of Columbia, have invented certain new and useful Improvements in Cores for Constructing Hollow Concrete Walls, of which the following is a description, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to that character of core by which bonded hollow monolithic concrete or composition walls may be constructed, and my invention consists in producing an improved core by which may be constructed a bonded hollow monolithic concrete or composition wall having the outer and inner wall parts bonded together and also having each layer bonded to the layer next adjacent above and below, so that each layer of molded wall may be formed integral and be made integral with the layer above and below, thus producing a wall which is better bonded and which to all purposes is equal to a wall formed in a single pouring, the bond also being strongest where the wall is weakest, that is, at the intersection of the adjacent layers.

As one of the drawbacks to concrete construction is the heavy initial expense of preparing cores I have borne in mind constantly the necessity of economy in construction in order to reduce this initial expense, and to this end have designed the cores with the idea of using them many times, of making them in varying coöperative unit lengths, of making them self-supporting, and of a permanent nature. As another drawback of concrete construction is the necessity of handling many pieces, through many operations, I have designed the cores with a view to having the parts easy of handling, easy of assembling and easy of dissecting. As another drawback of concrete construction is the heavy initial cost of material for the cores I have designed the cores in such a way that the most economical combination of material may be used, that is wood backing and galvanized iron facing, with a minimum cost in cutting and combining.

Referring to the drawings: Figure 1 is a detail of a section of wall produced by my improved cores especially illustrating the bonding across adjacent layers and showing a core in position, the section being taken on about the line 1—1 in Fig. 2. Fig. 2 is a cross section of the same on the line 2—2 in Fig. 1. Fig. 3 is a detail longitudinal section of the preferred form of core, such as used in Figs. 1 and 2. Fig. 4 is an end view of the same. Fig. 5 is a top view of the same. Fig. 6 is a detail top view of a part of the preferred form of core as proportioned for comparatively thin walls. Fig. 7 is a vertical longitudinal section of a section of wall illustrating the application of the preferred core adjacent windows or other openings in the wall. Fig. 8 is a vertical longitudinal section of a modified form of core on the line 8—8 of Fig. 9. Fig. 9 is a cross section of the same on the line 9—9 of Fig. 8. Fig. 10 is a top view of the same.

I have found that both iron and wood cores tend to adhere to the composition of the wall the former warping after drying out and the latter adhering more with additional use. I have found that by coating all the surfaces which contact with the concrete or composition with galvanized iron which is cheaper than copper plating or steel cores, I am able to produce cores that do not warp in repeated use and do not stick to the molded wall, the little composition which adheres after each application of the cores being easily washed off. The non-sticking is due to the nature of the coating of galvanized iron which has less tendency to adhere to concrete, and should it ever adhere may peel and thus give warning before damage results.

21 is the outer layer and 22 the inner layer of a hollow wall such as produced by my improved cores, the wall having bearing ledges 23 and being joined together by bonds having a triangular upper portion 24 and a triangular lower portion 25 formed integral and simultaneously.

My preferred form of the ordinary or upper course cores comprises inner and outer side plates 56 and 57 having both their wall and bond faces wider at the top than at the bottom, and end pieces 58 supported thereby and having their bond faces narrower at the top than at the bottom and having downwardly and outwardly extending feet 59. The wall faces of the side plates incline inwardly from the bottom up when in position and the bond faces of both side plates and end pieces incline outwardly from the

bottom up. The wall faces of the feet are vertical and are inset sufficiently so that they do not touch the wall when the core is in position and the bond faces of the feet are inclined inwardly from the bottom up. It will be seen that the two adjacent feet and the overhanging faces of the core above them make a diamond shaped pocket for the reception of composition which may creep past the edges next the wall enough to insure a rounded corner and good bond but cannot drop below. All the faces that are intended to contact with the wall are faced with galvanized iron.

The effect of a series of such cores is to form within the course of composition wall a series of hollow spaces with side faces inwardly inclined from the bottom up, separated by bonds diamond shaped in cross section, and pointed top and bottom. Superposition of such courses of wall furnishes narrow shelves or ledges upon which the cores for the next higher course may be supported and centered. The bonds are made in such a position that the widest and strongest part of the bond comes opposite the part of the wall which is thinnest and weakest, thus compensating for the loss of material due to the inclination of the wall faces. The ledge owing to the peculiar construction of the core is narrow and the inclination of wall slight, while a good angle or slant occurs between the side plates and end pieces whereby they are easily loosened.

The side plates of the core are provided with matching grooves 60 across their top surfaces near the ends thereof and the end pieces are further provided with L shaped brackets 61 secured fast thereto and pins 62 are set in the grooves and under the brackets and serve to position and secure the side plates and end pieces with relation to each other when the core is in position, or assembled. Clips 26 of galvanized iron may be used to hold the lower part of the core from spreading and also to catch the end pieces when they are dropped in the process of separating the core. Slots 68 in the inner sides of the side plates into which enter pins 69 projecting from the lower ends of the abutting edges of the end pieces aline and prevent any wabbling of the end pieces when the core is assembled.

When the core is to be removed from the completed course the pins 62 are pushed or knocked out, the end pieces dropped until the side plates are loosened, the side plates lifted out, the clip 26 removed, and the end pieces lifted out. The end pieces of each core are connected by a cord or wire 67 so that when they drop by the removal of the pins 62 they will straddle clip 26 or the next lower alternate bond and hang within reach until removed by hand. When the core is again assembled it is set on the ledges formed by the difference in width of the top and bottom of the hole, the feet being inset, passing easily into position between the sides of the hole, the inset being sufficient to enable them to clear the sides but not enough to permit the composition to drop.

The result of the operation is that the course next made not only has its inner and outer parts bonded together but is bonded to the course previously completed and will in turn have the course next above bonded to it.

In making walls where it is desirable that the wall be hollow and thin the construction of my preferred form of core allows of a core being made and worked as thin as desired owing to the fact that the end pieces are made with the grain running lengthwise of the piece allowing of the use of thin lumber and to the fact that the pin securing means can be used in very narrow cores, as it does not require the entrance of a tool or the hand into the space between the sides of the molds as does the construction illustrated in Figs. 8, 9 and 10 and cores now in use. This thin core differs from ordinary or upper course cores only in the thickness of the end pieces. The preferred form of core can be made as wide as necessary or as narrow as necessary.

A modification of my ordinary or upper course core is illustrated in Figs. 8, 9 and 10, wherein bolts 62^a are used to connect side plates 57^a and end pieces 58^a which carry depending feet 59^a. This core is of advantage only where the hollow portions of the wall are very wide in proportion to the solid portions of the wall. Two brackets and pins might be used similar to the brackets and pins used in the preferred form one bracket being secured toward one side and the other toward the other side of the core enabling short pins to be used.

Where it is necessary to superimpose bonds as at corners and openings core end pieces are used with feet that project only to a line dropped perpendicularly from a point on the outwardly inclined end face of the core at a distance from its top equal to the distance that the feet of the end wall extend below the body of the core. This curtailing of the feet, which is obtained by a greater slant of the inclined faces of the feet, permits the use of the core directly over the position of the core when making the course below and avoids cutting into the bond previously formed, but instead, adds to it, thus providing a bond which, in connection with the bonds of adjacent courses, extends from bottom to top of the opening on either side thereof. The spaces between the top and bottom of the continuous bonds may be closed by connecting the inner and outer parts of the course just below the sill with a piece of wire net 63 and depositing composition 64 thereon up to the line of the

sill to form the sill, and by depositing composition 65 on top of the frame forming the lintel. Both sill and lintel become self supporting on hardening, owing to their bonding with the wall.

The most important features of my invention therefore are the forming of a bond between courses by extending the feet of the core below the side plates thereof, the bond being preferably of diamond shape and widest at the line of juncture of adjacent courses, a feat not hitherto accomplished with unit or knockdown cores; the obtaining of an easy separation of core parts by making a good slant between the separating parts; the permitting of such a slant in combination with a narrow shelf on which to support the core by tapering the side plates of the core, producing a wall which varies very little in its thickness and is thereby made of uniform strength with the aid of the diamond shaped bond; the making of a complete closure or bond about an opening such as a window, without the use of special cores; the making of a perfectly bonded vermin and insect proof hollow composition wall; and the use of galvanized iron faced wooden cores in the interest of economy.

A wall constructed as outlined above is practically fire, moisture, vermin, and wear proof and a poor conductor of heat and cold owing to the fact that it is built of inner and outer portions connected only at intervals by staggered bonds, and when used as an interior wall can be readily prepared as a carrier of heat from one part of a house to another, heating pipes being led simply into the wall, and the heat being drawn from the hollow space at the point desired.

Having thus described my invention, the following is what I claim as new therein and desire to secure by Letters Patent:

1. A core comprising side plates and end pieces provided with downwardly and outwardly extending feet; the bond faces of both the side plates and the end pieces being inclined outwardly from the bottom up, and the bond faces of the feet being inclined inwardly from the bottom up.

2. A core comprising side plates and end pieces provided with downwardly and outwardly extending feet having vertical wall faces inset beneath the side plates; the bond faces of both the side plates and the end pieces being inclined outwardly from the bottom up, and the bond faces of the feet being inclined inwardly from the bottom up.

3. A core comprising side plates having both their wall and bond faces wider at the top than at the bottom and end pieces fitting between the side plates and having their bond faces wider at the bottom than at the top and provided with downwardly and outwardly extending feet; the bond faces of both the side plates and the end pieces being inclined outwardly from the bottom up, and the bond faces of the feet being inclined inwardly from the bottom up.

4. A core comprising side plates having both their wall and bond faces wider at the top than at the bottom and their wall faces inclined inwardly from the bottom up, and end pieces fitting between the side plates and having their bond faces wider at the bottom than at the top and provided with downwardly and outwardly extending feet; the bond faces of both the side plates and the end pieces being inclined outwardly from the bottom up and the bond faces of the feet being inclined inwardly from the bottom up.

5. A core comprising side plates, end pieces provided with downwardly and outwardly extending feet, and means for detachably securing the side plates and end pieces together; the bond faces of both the side plates and the end pieces being inclined outwardly from the bottom up, and the bond faces of the feet being inclined inwardly from the bottom up.

6. A core comprising side plates, end pieces provided with downwardly and outwardly extending feet, and pins and brackets detachably securing the side plates and end pieces together; the bond faces of both the side plates and the end pieces being inclined outwardly from the bottom up, and the bond faces of the feet being inclined inwardly from the bottom up.

7. A core comprising side plates, end pieces provided with downwardly and outwardly extending feet and a U-shaped clip for holding the side plates from spreading; the bond faces of both the side plates and the end pieces being inclined outwardly from the bottom up, and the bond faces of the feet being inclined inwardly from the bottom up.

ALPHONSO G. DRAKE.

Witnesses:
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WALTER ELLWOOD ALLEN.