No. 849,126. PATENTED APR. 2, 1907.

W. D. HAM.

MOLD FOR FORMING WALLS.

APPLICATION FILED MAY 24, 1906.

Fig. 1.

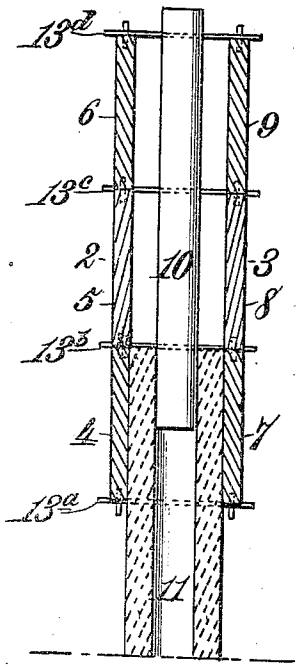


Fig. 2.

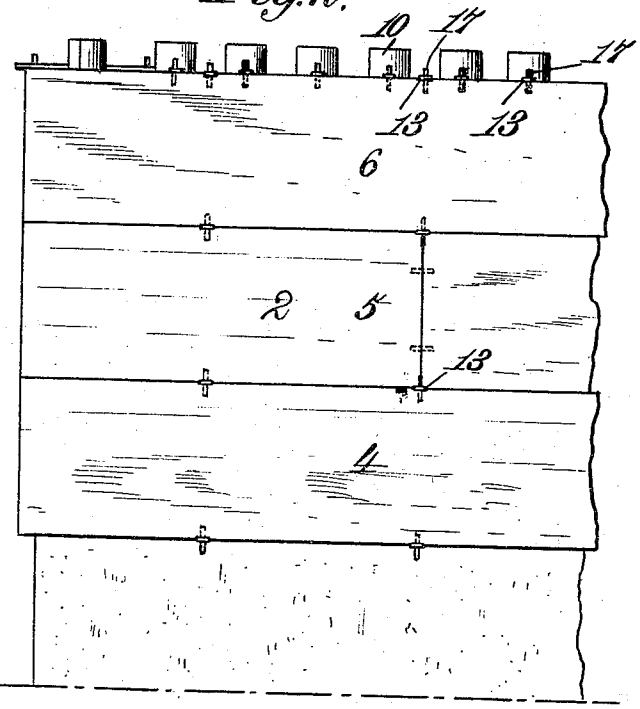


Fig. 4.

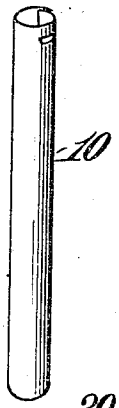


Fig. 3.

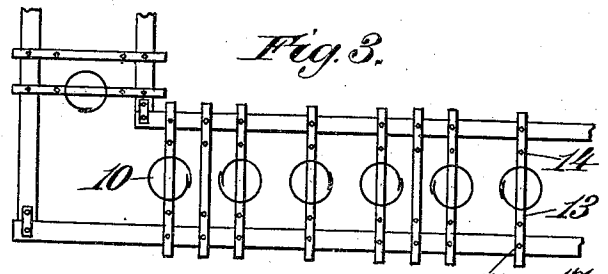


Fig. 5.

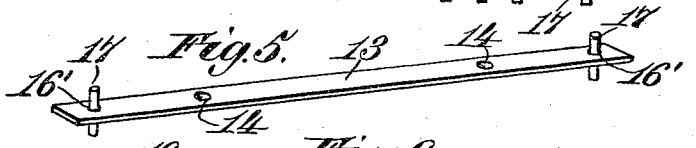


Fig. 6.

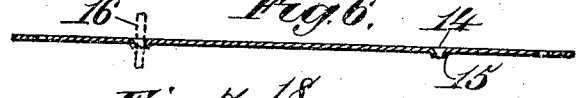


Fig. 8.

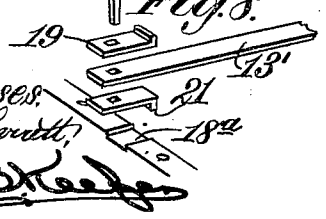
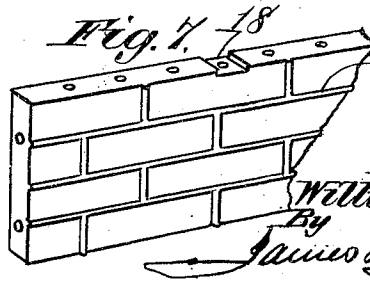


Fig. 7.



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UNITED STATES PATENT OFFICE.

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MOLD FOR FORMING WALLS.

No. 849,126. Specification of Letters Patent. Patented April 2, 1907.

Application filed May 24, 1906. Serial No. 318,586.

To all whom it may concern:

Be it known that I, WILLIAM D. HAM, a citizen of the United States, residing at Knoxville, in the county of Knox and State of Tennessee, have invented new and useful Improvements in Molds for Forming Walls, of which the following is a specification.

This invention relates to molds for forming walls.

I may make my wall of concrete, cement, or similar material and employ in the formation thereof mold mechanism of an advantageous character. The wall is of integral construction throughout, and it has therein air-spaces, which in the present case are in the nature of vertically-disposed flues. From the statement just made it will be obvious that the wall is seamless or jointless, which is not the case with a wall built up of bricks, blocks, or like articles. Walls of the latter type are objectionable in that the mortar or equivalent material employed in laying such blocks, bricks, or like articles carries moisture or water. By means of my wall this difficulty is wholly remedied and without affecting the stability of the wall. I employ the latter designation in a broad sense to include not only exterior walls, but interior walls or partitions.

In carrying out my invention I employ a mold generally composed of sectional sides and a core, the distance between said sides determining the thickness of the wall and the diameter of the core defining the size of said air-space. I may employ any number of these cores, and they may be of any desirable shape. The materials of which the said sides and core or cores are composed are immaterial, although wood planking may conveniently be utilized for constituting the sides, while metal may be employed to construct the said core or cores. I place the mold sides opposite each other and dispose the core therebetween and fill in the space between said sides with concrete in a plastic condition and afterward elevate the under mold side sections and place them on top of upper mold side sections and also elevate the core or cores, so as to provide additional inclosed space over the partially-formed wall in which the plastic cement or concrete can be placed to unite with the partially-formed wall. The elevation of the mold side sections and the core is practically simultaneous. I may to provide additional strength in the wall place therein anchoring, binding, or tying devices, which may be of any desirable character and material. These usually consist of metallic strips permanently fastened in the wall and have their ends during the construction of such wall extending outward beyond the side faces thereof, by reason of which said outwardly-extended ends can be advantageously employed as supports for the mold-sections. Afterward, if necessary, these outwardly-projecting ends can be sheared or clipped off, so as to leave no protrusions from the opposite faces of the wall, or such ends can be bent down, if desirable, into the wall and covered with concrete. The air-spaces in the wall insulate the interior of a building from the external atmosphere, so that the wall itself does not act as a conductor either for heat or cold. In addition to this these air-spaces serve as conduits for water, so that should any water be projected against the exterior of the wall it could not pass entirely therethrough, but would go only to the air-spaces, enter the same, and then descend to the bottom. From this it will be evident that the wall in addition to acting as a non-conductor for heat and cold also serves a like function with respect to water or other liquids, in view of which I can ornamentally face the interior of the wall to any desirable extent without possibility of such ornamental facing being injured by moisture applied externally.

In the drawings accompanying and forming part of this specification I show certain simple forms of embodiment of my invention; but I do not limit myself to the showing thus made, for certain variations may be adopted within the scope of my claims succeeding such description.

In said drawings, Figure 1 is a vertical section of a wall and a mold comprising my invention and showing the wall in process of construction. Fig. 2 is an inside face view of the same, and Fig. 3 a top plan view thereof. Fig. 4 is a detail view in perspective of a core. Fig. 5 is a like view of a tying-strip. Fig. 6 is a longitudinal section of said strip. Fig. 7 is a detail view in perspective of a modified form of mold side sections. Fig. 8 is a like view of one end of a modified form of anchoring-strip and certain coöperating parts.

Like characters refer to like parts throughout the several figures.

My mold involves two sides, (denoted in a general way, respectively, by 2 and 3,) these ordinarily being made in sections of any de-

sirable number. For example, the outer side 2 may consist of three sections 4, 5, and 6, while the inner side 3 may consist of similar sections, as 7, 8, and 9, all of which may be made of wood. This, however, is not essential, for the said parts may be of metal or be of composite construction as particular fancy may dictate. In addition to the sides 2 and 3 the mold comprises a core, as 10. In building a wall I employ a large number of these cores, as clearly shown in Figs. 2 and 3, such cores as represented in said two views being arranged in comparatively close order and being vertically disposed, so as to form in the wall in a manner that will hereinafter appear continuous vertical flues, as 11. (See Fig. 1.)

The cores 10 may, as previously indicated, be of any desirable shape. For example, they may be of cylindrical form, and they are generally made of metal in divided tubular form, the sheet from which the tube is made being overlapped, so as to provide for the contraction of the tube or core to facilitate the withdrawal of the same from a partially or completely formed wall. By making the tubes or cores in the form set forth it will be obvious that they are resilient, by reason of which they can be circumferentially reduced, whereby they can be readily pulled from place. I may extend through the cores, near their heads, anchoring-strips, as 13, which during the formation of the wall are sustained near their free outer ends by the mold sides 2 and 3. A strip 13 extends through each tubular core 10, diametrically thereof and substantially midway between the lapped joint of said core and a point substantially opposite said lapped joint, so as not to interfere with the resilience of the core. Such strips effectually position the cores 10 and prevent their movement and also positively space the same.

In Figs. 1 and 2 of the drawings I have shown a wall as partially formed, the height of such partially-formed wall agreeing with the combined width of two of the boards or planks composing the sides 2 and 3. When the wall is built up to a height agreeing with the width of one of said boards or planks, I lay transversely across the top thereof strips, as 13. These strips may be spaced apart any desirable distance, the same depending upon the thickness, length, and height of the wall to be made, and they are of such length that when laid into the wall their ends project beyond the opposite faces of said wall, as clearly shown in Figs. 1, 2, and 3, so that such projecting ends can be utilized to uphold the mold or the sections thereof. These strips may have perforations, as 14, punched therethrough, the stock being deflected downward in forming the perforations, so as to produce, in effect, barbs, as 15, which are embedded in the wall while the same is in a plastic condition to aid in holding such strips 13 in place. The strips may be further and securely retained in position by pins, as 16, driven through the perforations 14 and into the wall before the same is set.

When a line of strips is connected with the partially-formed wall, I mount upon the same the mold sides 2 and 3, placing the lower sections 4 and 7 upon the lowest strips 13^a in Fig. 1 and below the next higher strips 13^b in said figure. It will be seen that there are located near the outer ends of the strips 13 perforations 16′, which are located beyond the side faces of the wall, and I pass through these perforations dowel-pins, as 17, which enter corresponding openings in the planks or boards of the mold sides. I then place the sections 5 and 8 upon the strips 13^b and place on top of the same strips 13^c and connect the boards 5 and 8 with the boards 4 and 7 by said dowel-pins. On top of said boards 5 and 8 I place the strips 13^c and connect the same with said boards 5 and 8 by such dowel-pins, the boards 6 and 9 being then connected with the latter dowel-pins. The upper boards 6 and 9 then serve to sustain the strips 13^d, several of which support the cores 10. When the mold is thus assembled, I introduce said cores 10 into the space between the sides 2 and 3 and insert the lower ends of said cores into the upper portions of the previously-formed partially-made air spaces or flues 11 and also firmly maintain the cores in position in the manner hereinbefore set forth. When this is done, I fill in the space between the upper sections of the sides 2 and 3 with cement or concrete, and when the cement or concrete has set I draw out the core or cores, then withdraw the lowest dowel-pins 17, and place the lowest mold-sections 4 and 7 on top of the mold-sections 6 and 9, the strips 13^c being then disposed between the sections 4 and 6 and 7 and 9 and all being connected by dowel-pins, such as 17.

I may, as shown at 18 in Fig. 7, notch the upper and lower edges of the boards or sections comprising the sides of the mold, these notches or apertures being intended to accommodate the opposite projecting ends of the strips 13, as shown in Fig. 2, to thereby prevent endwise or longitudinal movement of the mold-sections and assure the formation of the wall in a perpendicular manner. By virtue of the positive but direct and separable connections between the mold-sections and the strips such mold-sections are prevented from being outwardly displaced as well as from inward collapse. In view therefore of the relations set forth I prevent movement in all directions of the sections of the mold, and thereby insure accurate and precise results.

It is not necessary in all cases to perforate the opposite ends of the strips 13 for the accommodation of dowel-pins, such as 17, for

in Fig. 8 I show an organization wherein it is not necessary to directly positively connect the mold-sections. The strip in this figure is designated 13′. The opposite ends of strip 13′ are engaged on the upper and lower sides by complemental plates 19, which are slotted, the slots in said plates 19 being adapted to register with the slots in the said strip 13′ and to receive wedge-pins, as 20. The plates 19 are adapted to fit in apertures, as 18ª, in superposed mold-sections, the pins 20 being located outside of said mold-sections and preventing outward displacement of the same, while flanges, as 21, at the inner ends of said plates prevent inward motion of said mold-sections. Endwise motion of said mold-sections is therefore prevented by reason of the fact that the clamping-plates 19 lie in apertures or notches in the mold-sections.

I may, as shown in Fig. 7, impose upon the inner surface of the mold-sections beads or projecting portions, as 22, so as to produce in the wall the effect of bricks or blocks.

It will be understood that the strips 13′ have each but two slots and these slots are intended to receive keys or wedge-pins 20, and said strips 13′ are plain or smooth, as it is not intended that the same should be permanently associated with the wall. The only object that these strips 13′ accomplish is to tie together or hold in assembled relation the sections of the mold. When a certain portion of the wall has been laid, these strips 13′ should be removed from place, and so that this act can be readily performed I oil them prior to their being laid in the wall, the oil having the effect of deadening the concrete immediately around such oiled strips. After such strips 13′ are driven from the wall, the openings made by them can be closed by concrete.

The strips 13 in addition to serving to reinforce or strengthen the wall also tie the mold-sections together. The strips 13, however, remain permanently in the wall.

The present invention is of the same general character as that set forth in my co-pending application, Serial No. 319,341, filed May 29, 1906.

In my claims I use the expression "cement." This designation is employed in a broad sense not only to include the substance so known to the trade, but to also include concrete material and any other article or composition that can be employed in making a wall possessing the characteristics hereinbefore set forth.

What I claim is—

1. A mold comprising opposite sides, a resilient core between said sides, and a strip supported by the upper edges of said sides, crossing the space between the latter, and removably connected with the upper end of the core, the latter being pendent from said strip.

2. A mold comprising opposite sides, a strip extending across and supported by the upper edges of said sides, and a divided tubular core between the sides, said core having openings near its upper end through which said strip removably passes for supporting the core, the latter being pendent from the strip.

3. A mold having sides composed of sections, and strips extending across the space between said sides, for holding the sections in operative relation with each other, and for also supporting said sections, said strips being separably related within the sections to permit the sections to be separated from the strips for leaving the latter permanently in the mass molded between said sides.

4. A mold comprising parallel sides, a strip extending across and supported by said sides, and a divided tubular core between the sides, said core having openings through which said strip passes to thereby support the core and the dividing-line of the core being disposed substantially centrally between said openings.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

WILLIAM D. HAM.

Witnesses:
HEATH SUTHERLAND,
BERNARD VASHON.